

# 学术图情动态

Library & Information Resources  
In Academic Trend

本期导览



长安大学图书馆

ESI月报

爱思唯尔2021“中国高被引学者”榜单长安大学高被引作者

Nature Latest Research Articles

国外交通运输工程发展动态关注（二）

综合运输类学术期刊介绍

2

2022





# 学术图情动态

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## ESI 月报

自 2018 年 5 月起，根据 ESI 数据库的更新时间，长安大学图书馆参考咨询部每单数月份会出具一份《长安大学 ESI 月报》，对我校 ESI 高被引论文、ESI 全球前 1% 学科以及我校优势潜力学科的表现力进行分析，以供学校相关职能部门、各院系、教职工参考查阅。

### 数据源简介：

Essential Science Indicators（基本科学指标，简称 ESI）是一个基于 Web of Science 核心合集数据库的深度分析型研究工具，它可以确定出在某个研究领域有影响力的国家、机构、论文、出版物以及研究前沿。这种独特而全面的、基于论文产出和引文影响力深入分析的数据是政府机构、大学、企业、出版公司和基金会的决策者、管理者、情报分析人员和信息专家理想的分析资源，用户可以通过它对科研绩效和发展趋势进行长期的定量分析。基于期刊论文发表数量和引文数据，ESI 能够提供 22 个学科研究领域中的国家、机构和期刊的科研绩效统计和科研实力排名。

ESI 高被引论文（Highly Cited Paper）是指将最近十年发表的论文按照同一年、同一 ESI 学科论文的被引频次由高到低进行排序，排在世界前 1% 的论文。从理论上讲，如果一篇论文被引频次达到前 1% 则表明该论文达到学科较高水平，具有较高的影响力。ESI 热点论文（Hot Paper）是指最近 2 年内发表的论文且该论文在最近 2 个月内被引次数排在全球相应学科领域的前 1% 以内。

本次数据统计分析时间：2022.5.13

联系电话：029-82339986

数据统计分析：尹 莉，张志惠

审核：史敏鸽

2022 年 5 月 12 日，最新一期的 ESI 数据更新，其统计数据覆盖的时间范围为 2012 年 1 月 1 日至 2022 年 2 月 28 日（跨度为十年两个月）。数据显示本次全球上榜机构总数为 7752 所，相对于 2022 年 3 月公布的数据减少了 132 所；中国上榜机构数为 686 所（大陆 584，台湾 85，香港 14，澳门 3），比 2022 年 3 月增加了 3 所。本期中国进入全球前千分之一学科的高校有 216 个，比上期增加 14 个；进入全球前百分之一学科的高校有 1838 个，比上期增加 53 个，表现非常强劲。

表 1 2022 年 5 月进入 ESI 前 1%和前 1‰学科的中国高校数量情况

学科	全国 1% 高校数	全国 1‰高校数
计算机科学	105 (8)	20 (4)
工程科学	263 (2)	49 (2)
材料科学	186 (1)	36 (1)
生物与生化	93 (4)	5 (0)
环境/生态学	115 (6)	8 (2)
微生物学	27 (1)	0 (0)
分子生物与遗传学	50 (1)	1 (0)
一般社会科学	79 (4)	1 (0)
经济与商学	18 (1)	0 (0)
化学	227 (4)	35 (2)
地球科学	55 (6)	7 (1)
数学	55 (3)	1 (1)
物理学	47 (-2)	4 (-1)
空间科学	2 (1)	0 (0)
农业科学	96 (4)	9 (0)
植物与动物科学	86 (3)	7 (0)
临床医学	125 (0)	20 (1)
免疫学	39 (1)	0 (0)
神经科学与行为	49 (0)	0 (0)
药理学与毒物学	91 (0)	13 (1)
精神病学/心理学	21 (3)	0 (0)
多学科	9 (2)	0 (0)
总计	1838 (53)	216 (14)

注：括号内为本期新增该学科进入 ESI 的高校数量

本期全国共 13 所高校 15 个学科新晋全球前千分之一，分别为北京大学、东北大学、华南理工大学、同济大学的计算机科学，吉林大学、深圳大学的工程科学，郑州大学的材料科学，同济大学、中山大学的环境/生态学，东南大学、江苏大学的化学，南京信息工程大学的地球科学，山东科技大学的数学，山东第一

医科大学的临床医学，吉林大学的药理学与毒物学，千分之一学科退出1个。全国共59所高校65个学科新晋全球前百分之一，其中南方科技大学新晋3个学科，河南大学、汕头大学、西安科技大学、中国科学院大学各新晋2个学科，另有54所高校新晋1个学科。

表2 2022年5月中国高校ESI学科数量变化情况

高校名称	学科	说明
北京大学	计算机科学	新晋 1‰
东北大学	计算机科学	新晋 1‰
华南理工大学	计算机科学	新晋 1‰
同济大学	计算机科学	新晋 1‰
吉林大学	工程科学	新晋 1‰
深圳大学	工程科学	新晋 1‰
郑州大学	材料科学	新晋 1‰
同济大学	环境/生态学	新晋 1‰
中山大学	环境/生态学	新晋 1‰
东南大学	化学	新晋 1‰
江苏大学	化学	新晋 1‰
南京信息工程大学	地球科学	新晋 1‰
山东科技大学	数学	新晋 1‰
山东第一医科大学	临床医学	新晋 1‰
吉林大学	药理学与毒物学	新晋 1‰
北京化工大学	计算机科学	新晋 1‰
江西财经大学	计算机科学	新晋 1‰
解放军信息工程大学	计算机科学	新晋 1‰
南方科技大学	计算机科学	新晋 1‰
四川师范大学	计算机科学	新晋 1‰
西安理工大学	计算机科学	新晋 1‰
西安邮电大学	计算机科学	新晋 1‰
西南财经大学	计算机科学	新晋 1‰
浙江师范大学	计算机科学	新晋 1‰
安徽财经大学	工程科学	新晋 1‰
安徽师范大学	工程科学	新晋 1‰
辽宁科技大学	工程科学	新晋 1‰
中原工学院	工程科学	新晋 1‰
华北理工大学	材料科学	新晋 1‰
西安科技大学	材料科学	新晋 1‰
中央民族大学	材料科学	新晋 1‰
福建医科大学	生物与生化	新晋 1‰
河南大学	生物与生化	新晋 1‰
西南医科大学	生物与生化	新晋 1‰
浙江中医药大学	生物与生化	新晋 1‰
江汉大学	环境/生态学	新晋 1‰

高校名称	学科	说明
上海理工大学	环境/生态学	新晋 1%
首都师范大学	环境/生态学	新晋 1%
首都医科大学	环境/生态学	新晋 1%
新疆大学	环境/生态学	新晋 1%
中国计量大学	环境/生态学	新晋 1%
中南大学	微生物学	新晋 1%
汕头大学	分子生物与遗传学	新晋 1%
南京信息工程大学	一般社会科学	新晋 1%
天津医科大学	一般社会科学	新晋 1%
西北农林科技大学	一般社会科学	新晋 1%
<b>长安大学</b>	<b>一般社会科学</b>	<b>新晋 1%</b>
北京理工大学	经济与商学	新晋 1%
成都理工大学	化学	新晋 1%
淮阴师范学院	化学	新晋 1%
上海电力大学	化学	新晋 1%
绍兴文理学院	化学	新晋 1%
西安建筑科技大学	化学	新晋 1%
北京科技大学	地球科学	新晋 1%
成都信息工程大学	地球科学	新晋 1%
南方科技大学	地球科学	新晋 1%
西安科技大学	地球科学	新晋 1%
云南大学	地球科学	新晋 1%
长江大学	地球科学	新晋 1%
华南理工大学	数学	新晋 1%
江苏师范大学	数学	新晋 1%
中国科学院大学	数学	新晋 1%
中国科学院大学	空间科学	新晋 1%
河南大学	农业科学	新晋 1%
青岛大学	农业科学	新晋 1%
云南农业大学	农业科学	新晋 1%
郑州大学	农业科学	新晋 1%
郑州轻工业大学	农业科学	新晋 1%
湖南师范大学	植物与动物科学	新晋 1%
汕头大学	植物与动物科学	新晋 1%
西南林业大学	植物与动物科学	新晋 1%
中国人民大学	临床医学	新晋 1%
南方科技大学	免疫学	新晋 1%
宁波大学	药理学与毒物学	新晋 1%
新乡医学院	药理学与毒物学	新晋 1%
广州医科大学	精神病学/心理学	新晋 1%

5 月份中国大陆高校 ESI 排名全名单见表 3(按照进入 ESI 前 1%的学科数量排名)。

表3 2022年5月中国大陆高校ESI排名情况

国内排名	国际排名	学校名称	前1%学科数	论文总数	总被引数	篇均被引	高被引论文
1	41	中国科学院大学	21	151663	2436685	16.07	2448
2	51	清华大学	21	96894	2079724	21.46	2486
5	63	北京大学	22	94434	1889822	20.01	1927
4	65	上海交通大学	21	115228	1883218	16.34	1681
5	70	浙江大学	21	112563	1811187	16.09	1725
6	109	复旦大学	21	77258	1420565	18.59	1356
7	113	中山大学	20	81527	1364237	16.75	1354
8	122	华中科技大学	20	75012	1503442	17.58	1431
9	130	中国科学技术大学	16	62328	1245835	19.99	1482
10	146	南京大学	19	59706	1185756	19.86	1152
11	188	武汉大学	19	57512	998185	17.56	1144
12	189	中南大学	18	67027	998085	14.89	1099
15	190	四川大学	19	72786	997131	13.7	883
14	197	山东大学	19	67565	961290	14.27	747
15	203	西安交通大学	16	65762	946804	14.4	907
16	219	吉林大学	18	61482	896153	14.58	655
17	221	哈尔滨工业大学	12	60598	890881	14.7	921
18	248	华南理工大学	12	44509	824077	18.51	889
19	256	同济大学	15	53212	794394	14.95	717
20	259	天津大学	15	51222	789729	15.42	848
21	264	苏州大学	16	41287	776559	18.8	781
22	286	东南大学	15	49884	718839	14.41	790
25	311	中国医学科学院 北京协和医学院	13	41666	675275	16.21	608
24	529	南开大学	15	51247	643921	20.61	701
25	333	厦门大学	19	36119	633005	17.55	637
26	558	大连理工大学	10	41441	624058	15.06	551
27	364	湖南大学	11	28115	566992	20.17	959
28	566	北京航空航天大学	10	59957	561180	14.04	628
29	380	郑州大学	14	42154	543869	12.9	903
50	590	首都医科大学	11	38861	534277	15.75	555
51	423	北京协和医学院	12	51975	495097	15.48	574
52	428	重庆大学	12	56569	492085	15.55	572
55	429	北京理工大学	9	55555	491869	14.75	742
34	436	北京师范大学	15	51094	481688	15.49	463
55	448	电子科技大学	15	35829	473417	13.21	816
56	449	中国地质大学	7	52474	473116	14.57	459
57	457	南京医科大学	9	53086	466177	14.09	296
58	464	兰州大学	14	29164	459729	15.76	390
59	478	西北工业大学	7	34816	445164	12.79	622
40	486	华东理工大学	8	24252	438555	18.1	557

国内 排名	国际 排名	学校名称	前1% 学科数	论文 总数	总被 引数	篇均被引	高被引论 文
41	495	中国农业大学	14	27096	427127	15.76	396
42	501	北京科技大学	7	28890	425371	14.72	596
43	543	北京化工大学	6	19505	395940	20.51	420
44	544	深圳大学	14	28345	593882	15.9	594
45	549	武汉理工大学	6	20470	388526	18.98	501
46	560	江苏大学	10	26699	575659	14.07	495
47	574	中国石油大学	7	28218	361306	12.8	326
48	575	华东师范大学	14	25056	560555	15.64	411
49	587	上海大学	10	25783	354758	13.76	380
50	628	暨南大学	15	24974	537572	15.52	510
51	638	西北农林科技大学	11	23319	550562	14.18	278
52	642	南京农业大学	10	20978	326955	15.59	295
55	648	南京理工大学	6	25016	321638	15.97	568
54	655	南方医科大学	9	24587	518945	15.08	220
55	661	南京工业大学	5	17897	316676	17.69	311
56	679	江南大学	9	23381	305953	13	260
57	687	福州大学	6	15996	301709	18.86	394
58	697	华中农业大学	11	18479	299027	16.18	288
59	699	中国矿业大学	8	26459	298789	11.3	351
60	710	西南大学	14	21594	294935	13.79	221
61	722	东北大学	5	27215	290889	10.69	502
62	740	中国人民解放军 海军军医大学	10	15546	282924	18.44	164
63	748	南京航空航天大学	7	24562	280410	11.42	515
64	759	青岛大学	12	20741	272529	13.13	496
65	760	南昌大学	10	21252	271792	12.8	255
66	776	天津医科大学	9	17856	261575	14.65	155
67	803	中国海洋大学	10	19586	249785	12.75	217
68	808	东华大学	7	14407	248054	17.22	221
69	818	中国人民解放军 空军军医大学	7	15852	244998	17.71	105
70	827	温州医科大学	8	18507	240096	13.11	160
71	841	中国医科大学	7	19447	255818	12.02	129
72	843	中国人民解放军 陆军军医大学	8	15550	255142	17.21	151
73	848	浙江工业大学	8	17277	252457	15.45	272
74	858	南方科技大学	9	14648	228581	15.59	558
75	863	哈尔滨医科大学	6	14565	227140	15.59	155
76	875	西安电子科技大学	5	22207	224416	10.11	257
77	885	广州医科大学	8	14901	219907	14.76	205
78	893	扬州大学	11	17578	217462	12.51	285
79	905	重庆医科大学	8	16引8	215499	15.21	117

国内 排名	国际 排名	学校名称	前1% 学科数	论文 总数	总被 引数	篇均被引	高被引论 文
80	910	南京信息工程大学	8	16456	214741	15.05	546
81	912	合肥工业大学	8	16660	214515	12.88	189
82	928	北京工业大学	6	15666	209877	15.4	190
85	948	华中师范大学	8	10507	204255	19.44	245
84	957	华北电力大学	6	14668	202049	15.77	260
85	960	西南交通大学	6	18507	200158	10.95	221
86	966	南京师范大学	10	14413	199460	15.84	216
87	968	山东第一医科大学	7	15485	199097	12.86	108
88	985	华南农业大学	10	14525	194255	15.58	200
89	990	西北大学	10	14705	195482	15.16	154
90	996	北京交通大学	6	17602	191891	10.9	205
91	1010	河海大学	9	18447	188859	10.24	224
92	1055	华南师范大学	9	14772	184106	12.46	165
95	1054	济南大学	6	12167	185986	15.12	155
94	1055	广东工业大学	5	13886	180555	15	526
95	1075	中国人民解放军 国防科技大学	6	19252	177592	9.22	130
96	1076	中国药科大学	6	11802	177096	15.01	76
97	1096	陕西师范大学	8	12750	174595	15.72	176
98	1100	东北师范大学	6	11155	173921	15.59	135
99	1111	哈尔滨工程大学	4	14228	171425	12.05	156
100	1115	安徽医科大学	7	15456	171277	12.75	102
101	1159	宁波大学	8	14779	165467	11.2	157
102	1145	山东科技大学	7	12435	165081	15.28	436
103	1181	南京邮电大学	5	10960	158822	14.49	206
104	1210	河南大学	9	11825	152147	12.87	194
105	1216	北京林业大学	8	11364	150924	13.28	118
106	1227	太原理工大学	5	12894	148285	11.5	102
107	1243	青岛科技大学	3	10093	145555	14.42	194
108	1249	北京邮电大学	4	14611	144875	9.92	192
109	1282	山西大学	8	11652	141044	12.1	115
110	1285	广西大学	7	15220	140525	10.65	148
111	1302	昆明理工大学	6	12940	138040	10.67	123
112	1525	安徽大学	5	10926	134434	12.3	151
113	1346	浙江师范大学	6	7971	130917	16.42	246
114	1358	南京林业大学	7	12400	129076	10.41	198
115	1370	南通大学	7	11939	127872	10.71	89
116	1406	山东师范大学	5	9586	123765	12.91	210
117	1412	杭州师范大学	8	8195	122923	15	126
118	1416	燕山大学	4	10531	121924	11.58	150
119	1418	中国人民大学	8	9158	121609	13.28	129
120	1424	湘潭大学	4	8597	120576	14.05	98

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121	1431	上海科技大学	5	6506	119518	18.57	197
122	1466	上海理工大学	5	10937	115445	10.56	177
123	1485	大连医科大学	5	8586	115555	13.25	39
124	1496	福建医科大学	5	12065	112298	9.31	92
125	1501	福建农林大学	7	8837	111988	12.67	135
126	1505	广州大学	6	9635	111506	11.58	246
127	1509	河南师范大学	4	8543	111136	13.01	125
128	1510	浙江理工大学	5	8450	111150	15.15	91
129	1529	四川农业大学	5	9650	109672	11.56	95
150	1534	南京中医药大学	4	8981	109229	12.16	58
131	1574	汕头大学	7	7932	105626	13.32	95
152	1589	广西医科大学	4	8625	104140	12.07	61
135	1599	湖南师范大学	5	9329	103380	11.08	95
134	1655	山东农业大学	4	7750	100037	12.91	77
135	1659	湖北大学	3	6847	98002	14.31	77
156	1677	云南大学	6	9544	97096	10.17	68
137	1685	东北农业大学	6	8078	96441	11.94	141
158	1706	杭州电子科技大学	4	9134	94641	10.56	128
139	1709	河北医科大学	4	9195	94604	10.29	40
140	1710	曲阜师范大学	5	7129	94546	15.26	218
141	1724	天津工业大学	4	8090	95597	11.54	74
142	1752	武汉科技大学	4	7624	92740	12.16	111
143	1759	常州大学	3	7551	92056	12.52	53
144	1744	上海中医药大学	5	7998	91716	11.47	47
145	1746	西南石油大学	4	8910	91629	10.28	97
<b>146</b>	<b>1751</b>	<b>长安大学</b>	<b>5</b>	<b>10180</b>	<b>91431</b>	<b>8.98</b>	<b>151</b>
147	1760	东北林业大学	6	8053	90710	11.26	75
148	1772	首都师范大学	5	7242	90164	12.45	64
149	1820	沈阳药科大学	4	6656	87504	13.15	39
150	1825	齐鲁工业大学	4	8772	87346	9.96	84
151	1826	上海师范大学	5	6618	87228	13.18	98
152	1852	河北工业大学	5	9184	86980	9.47	97
155	1838	长沙理工大学	5	6643	86654	13.04	275
154	1858	福建师范大学	5	7175	85121	11.87	97
155	1861	徐州医科大学	4	7276	85055	11.69	38
156	1882	江苏师范大学	4	6028	85387	15.85	86
157	1886	天津理工大学	3	5625	85504	14.81	106
158	1892	华侨大学	4	6559	82905	12.68	100
159	1893	江西师范大学	4	5996	82899	13.85	61
160	1899	温州大学	4	5745	82618	14.38	151
161	1904	湖南农业大学	6	5601	81938	14.65	106
162	1908	黑龙江大学	5	4655	81494	17.51	79

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165	1915	广州中医药大学	2	7752	81190	10.5	41
164	1925	江苏科技大学	5	6859	80777	11.78	118
165	1928	西南科技大学	3	6792	80508	11.85	132
166	1979	武汉工程大学	5	5222	77189	14.78	105
167	2002	天津科技大学	4	6327	76064	12.02	44
168	2021	西安理工大学	4	8278	75349	9.1	107
169	2024	河南科技大学	6	7764	75224	9.69	93
170	2025	浙江农林大学	5	5005	75090	15	124
171	2036	河南理工大学	4	7237	74506	10.3	127
172	2055	贵州大学	4	8930	73909	8.28	95
175	2064	海南大学	5	6819	73236	10.74	95
174	2065	河北大学	5	7405	75201	9.89	45
175	2096	广东医科大学	2	4795	71865	14.99	47
176	2098	陕西科技大学	5	6071	71797	11.85	97
177	2101	北京中医药大学	2	7139	71530	10.02	49
178	2110	西北师范大学	5	6476	71116	10.98	55
179	2114	南华大学	3	6176	70966	11.49	72
180	2126	中国计量大学	4	5900	70455	11.94	61
181	2181	西安建筑科技大学	4	6555	67617	10.32	129
182	2215	新疆大学	4	6615	66565	10.04	55
183	2214	大连海事大学	3	6446	66361	10.29	117
184	2221	安徽师范大学	5	5064	66147	15.06	62
185	2224	聊城大学	3	5545	66014	11.91	112
186	2250	兰州理工大学	5	6557	65849	10.07	77
187	2266	安徽工业大学	3	4603	64745	14.07	106
188	2279	青岛农业大学	5	5148	64398	12.51	61
189	2281	上海海洋大学	4	6155	64292	10.45	44
190	2285	三峡大学	4	5422	64251	11.85	75
191	2291	华北理工大学	5	4505	64016	14.21	78
192	2555	昆明医科大学	2	6065	61541	10.15	37
193	2422	中北大学	3	6345	58695	9.25	80
194	2426	石河子大学	4	5757	58617	10.18	25
195	2448	成都理工大学	4	6629	57814	8.72	55
196	2455	山西医科大学	2	6046	57610	9.53	58
197	2470	安徽农业大学	3	4931	57138	11.59	61
198	2505	中南民族大学	5	3834	56079	14.65	42
199	2509	渤海大学	4	3089	55937	18.11	158
200	2522	河南农业大学	5	5164	55510	10.75	76
201	2523	北京工商大学	2	5456	55500	10.17	86
202	2550	湖南科技大学	5	4836	55218	11.42	75
203	2532	桂林电子科技大学	3	5643	55045	9.75	72
204	2534	浙江中医药大学	5	5857	54795	9.59	40

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205	2548	长江大学	4	6259	54347	8.68	60
206	2550	烟台大学	4	5009	54309	10.84	74
207	2583	广西师范大学	2	4682	53515	11.43	47
208	2586	浙江工商大学	5	4684	53455	11.41	64
209	2625	河南工业大学	3	4381	52241	11.92	44
210	2675	新疆医科大学	1	4772	50505	10.58	34
211	2708	山东理工大学	3	5300	49561	9.55	41
212	2712	南昌航空大学	5	3645	49466	15.57	54
213	2727	新乡医学院	2	4425	49030	11.09	16
214	2755	天津师范大学	2	4155	48905	11.78	42
215	2751	内蒙古大学	3	4264	48561	11.39	45
216	2769	桂林理工大学	2	4775	47989	10.05	50
217	2772	广东药科大学	4	4170	47969	11.5	22
218	2781	重庆邮电大学	2	4921	47726	9.7	81
219	2788	郑州轻工业大学	4	3996	47545	11.9	72
220	2789	香港中文大学(深圳)	2	5524	47521	14.3	72
221	2791	西南医科大学	3	4912	47429	9.66	51
222	2800	上海海事大学	5	4569	47098	10.51	82
223	2909	四川师范大学	3	3480	44441	12.77	99
224	2950	河北师范大学	2	4128	43912	10.64	25
225	2957	重庆工商大学	2	2570	43856	17.06	84
226	2962	长春理工大学	5	5187	43297	8.55	26
227	2978	中南林业科技大学	3	3503	42819	12.22	82
228	3009	宁夏医科大学	2	5521	42268	12	27
229	3010	哈尔滨理工大学	3	4710	42252	8.97	48
250	5015	中国人民解放军 陆军工程大学	2	5052	42167	8.55	52
251	3044	西华师范大学	2	2695	41425	15.38	48
252	3055	上海电力大学	5	2856	41185	14.42	51
255	5056	东莞理工学院	2	5514	41124	12.41	61
234	5065	江西理工大学	5	4065	40925	10.07	69
255	3073	湖北工业大学	2	3669	40847	11.13	48
256	3085	湖州师范学院	5	5952	40627	10.28	182
257	3086	上海应用技术大学	4	3832	40605	10.6	20
258	5106	滨州医学院	2	3414	40072	11.74	28
259	3117	吉林农业大学	2	4321	59890	9.23	19
240	5122	哈尔滨师范大学	2	2600	59785	15.5	52
241	3123	湖北医药学院	1	3106	59765	12.8	23
242	5124	辽宁大学	2	5507	59689	12	28
243	5127	湖南工业大学	2	2290	59631	17.51	66
244	5150	沈阳农业大学	2	4255	59595	9.31	29
245	3177	西安科技大学	3	4231	38757	9.16	101

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246	5196	西南财经大学	4	5910	58541	9.81	158
247	3201	兰州交通大学	2	3522	38254	10.86	59
248	5243	武汉纺织大学	5	2950	57458	12.7	25
249	5272	河北农业大学	2	5614	36927	10.22	29
250	5281	上海工程技术大学	5	4475	56752	8.22	55
251	3282	天津中医药大学	2	3484	36734	10.54	15
252	5500	淮北师范大学	1	1985	56594	18.55	59
255	3301	成都中医药大学	2	4329	36391	8.41	40
254	5517	云南师范大学	2	3082	56137	11.75	59
255	3342	贵州医科大学	2	3854	55658	9.25	28
256	3560	绍兴文理学院	2	5135	35295	11.27	60
257	5567	鲁东大学	1	3636	55117	9.66	29
258	5571	安徽理工大学	1	4114	55045	8.52	28
259	3401	嘉兴学院	1	3675	34728	9.45	38
260	3402	佛山科学技术学院	1	5580	34725	9.7	82
261	3404	青岛理工大学	1	3387	34691	10.24	108
262	3407	延边大学	1	5147	54666	11.02	10
265	3418	重庆师范大学	1	3195	34501	10.8	70
264	3419	宁波诺丁汉大学	2	2580	34477	15.56	48
265	3431	盐城工学院	3	3062	34257	11.19	32
266	3455	苏州科技大学	2	3498	34244	9.79	58
267	3434	江西农业大学	2	3368	34243	10.17	28
268	5454	昆山杜克大学	1	700	35956	48.48	55
269	3463	大连工业大学	3	3237	55792	10.44	38
270	5504	信阳师范学院	1	2747	33194	12.08	25
271	3520	上海财经大学	3	3412	32850	9.63	54
272	5551	临沂大学	1	5180	52649	10.27	51
273	5534	台州学院	1	3117	32618	10.46	43
274	5568	遵义医科大学	2	3765	52115	8.55	11
275	3584	东华理工大学	2	5515	51906	9.62	18
276	5591	南阳师范学院	1	1928	51862	16.55	37
277	3600	西安医学院	1	2890	51711	10.97	16
278	5657	宁夏大学	2	5572	51066	8.7	24
279	5661	洛阳师范学院	1	2542	30984	12.19	45
280	5671	辽宁师范大学	1	5594	50852	9.09	25
281	3691	锦州医科大学	2	2676	50585	11.55	11
282	5695	中国人民解放军 空军工程大学	1	5795	50519	7.99	22
283	5724	济宁医学院	1	2871	29955	10.43	17
284	5746	西交利物浦大学	5	2724	29591	10.86	51
285	5757	淮阴师范学院	1	2387	29444	12.34	62
286	5792	河北科技大学	2	2754	28911	10.5	29

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287	3800	辽宁工业大学	2	1380	28775	20.85	97
288	3804	潍坊医学院	1	2898	28720	9.91	18
289	3821	中央民族大学	1	1935	28410	14.68	41
290	5822	山西农业大学	2	5026	28405	9.59	17
291	3824	武汉轻工大学	1	2195	28388	12.93	26
292	3827	浙江海洋大学	2	2718	28555	10.42	51
293	5844	山东中医药大学	1	2898	28097	9.7	17
294	3847	江汉大学	1	2255	28058	12.55	24
295	3872	吉林师范大学	2	2462	27712	11.26	32
296	3879	长春工业大学	5	2595	27649	10.65	17
297	5923	海南医学院	1	2749	27125	9.87	27
298	5946	华东交通大学	1	3305	26874	8.15	50
299	5956	成都信息工程大学	1	3179	26718	8.4	24
300	5967	重庆理工大学	2	2858	26577	9.5	19
301	3986	集美大学	2	2922	26350	9.02	30
302	5988	广东海洋大学	1	5146	26342	8.37	25
303	4008	东北石油大学	1	3020	26090	8.64	43
304	4025	江西科技师范大学	1	2026	25959	12.8	17
305	4038	成都大学	1	3222	25652	7.96	86
306	4040	云南农业大学	2	2575	25631	10.79	27
307	4048	蚌埠医学院	1	2591	25555	9.86	18
308	4075	安阳师范学院	1	1524	25260	16.57	9
309	4082	江西财经大学	3	2101	25139	11.97	41
310	4127	大连大学	1	2561	24831	10.52	14
311	4152	福建中医药大学	1	1905	24542	12.9	2
312	4181	山西师范大学	1	2722	24221	8.9	18
313	4185	北京建筑大学	2	2305	24165	10.48	50
314	4188	内蒙古医科大学	1	2192	24105	11	15
315	4207	中央财经大学	3	2751	23981	8.78	25
316	4217	太原科技大学	1	2805	25866	8.51	50
317	4221	南京财经大学	2	2265	23811	10.51	43
318	4225	内蒙古农业大学	2	2794	23782	8.51	15
319	4245	淮阴工学院	1	2637	23460	8.9	33
320	4272	桂林医学院	1	2170	25247	10.71	15
321	4276	西安工业大学	2	2912	23240	7.98	43
322	4285	辽宁石油化工大学	2	2268	25159	10.2	24
323	4286	黑龙江中医药大学	2	1810	23112	12.77	5
324	4311	河北工程大学	1	2567	22855	8.89	16
325	4318	对外经济贸易大学	3	2440	22727	9.31	65
326	4329	重庆交通大学	1	2865	22641	7.9	51
327	4374	沈阳工业大学	2	2722	22074	8.11	26
328	4384	西华大学	1	2829	21917	7.75	19

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329	4395	皖南医学院	1	2241	21828	9.74	13
330	4431	沈阳航空航天大学	1	2144	21570	9.97	24
331	4433	湖南中医药大学	2	2095	21356	10.2	17
332	4446	甘肃农业大学	2	2581	21192	8.21	15
333	4506	辽宁科技大学	1	2522	20636	8.18	25
334	4539	河南科技学院	2	2268	20208	8.91	9
335	4574	安徽工程大学	1	2026	19891	9.82	29
336	4583	华北水利水电大学	1	2965	19842	6.69	14
337	4608	浙江财经大学	2	1955	19629	10.04	22
338	4612	江西中医药大学	1	2546	19581	8.55	14
339	4641	闽江学院	2	1972	19329	9.8	30
340	4704	厦门理工学院	1	2175	18795	8.64	21
341	4738	天津城建大学	1	1738	18467	10.65	18
342	4744	东北电力大学	1	2214	18419	8.52	49
343	4791	内蒙古工业大学	1	2530	17943	7.09	8
344	4802	川北医学院	1	2208	17850	8.08	9
345	4803	广东石油化工学院	1	1565	17822	11.39	38
346	4810	赣南师范大学	1	1509	17797	11.79	18
347	4814	沈阳化工大学	1	1822	17761	9.75	6
348	4817	中国民航大学	1	2555	17759	7.6	47
349	4818	山东建筑大学	1	2565	17755	6.91	19
350	4820	中南财经政法大学	1	2262	17750	7.84	54
351	4822	湖北文理学院	1	1588	17716	11.16	21
352	4859	西安邮电大学	2	2588	17518	7.34	29
353	4886	南京工程学院	1	2509	17164	6.84	11
354	4902	成都医学院	1	1755	17022	9.81	11
355	4919	东北财经大学	1	1295	16876	13.03	34
356	4955	大连海洋大学	1	1798	16757	9.52	7
357	4954	浙江科技学院	1	1990	16586	8.55	17
358	4970	西安石油大学	1	2597	16495	6.55	17
359	5037	中原工学院	1	1705	15952	9.36	20
360	5040	西南林业大学	1	1925	15910	8.26	19
361	5081	河南中医药大学	1	2107	15592	7.4	4
362	5096	湖北中医药大学	1	1585	15490	11.18	12
363	5105	山东财经大学	2	1581	15388	9.75	31
364	5140	中国人民解放军战略 支援部队信息工程大学	2	2628	15222	5.79	15
365	5146	杭州医学院	1	2125	15186	7.15	19
366	5163	安徽中医药大学	1	1765	15087	8.55	5
367	5232	福建工程学院	1	1702	14607	8.58	26
368	5543	北方工业大学	1	1812	13752	7.58	15
369	5370	湖北理工学院	1	991	13496	13.62	8

国内排名	国际排名	学校名称	前 1% 学科数	论文总数	总被引数	篇均被引	高被引论文
370	5577	石家庄铁道大学	1	1927	13435	6.97	9
371	5385	大理大学	1	1366	13386	9.8	21
372	5520	北京信息科技大学	1	2046	12510	6.11	19
373	5568	广东外语外贸大学	1	1504	12243	8.14	30
374	5658	上海体育学院	1	1475	11916	8.09	5
375	5640	中国人民解放军 海军工程大学	1	1645	11902	7.24	6
376	5655	北京农学院	1	1175	11804	10.05	7
377	5922	沈阳建筑大学	1	1238	10317	8.55	7
378	6143	安徽财经大学	1	880	9192	10.45	46

下面对长安大学在本次统计数据覆盖时间范围内的表现进行分析。

## 一. 长安大学 ESI 高被引论文情况

本次 ESI 统计数据显示，全球位列 ESI 高水平研究机构总数为 7752 所，我校位列 1751 位，ESI 全球排位 22.59%（上期为 23.83%），较上期上涨 1.24%，**近几期全球排位百分比一直处于上升趋势**；中国位列 ESI 全球高水平研究机构总数为 686 所，我校位列 220 位，ESI 中国机构排位 32.07%（上期为 33.53%），较上期上涨 1.46%。

### 1. 高被引、热点论文概况

本期长安大学共有五个 ESI 学科进入全球排名前 1%，分别为：**工程学 (Engineering)**、**材料科学 (Materials Science)**、**地球科学(Geosciences)**、**环境/生态科学 (Environment/Ecology)** 和 **社会科学总论 (SOCIAL SCIENCES, GENERAL)**。本次数据统计覆盖范围内，我校发表的 WOS 论文总数为 10,180，总被引频次为 91,431 次，篇均被引频次为 8.98 次，较上期均有所提升；其中 ESI 高被引论文有 131 篇（详见本期长安大学 ESI 高被引论文索引，其发表的年代分布见图 1），比上期（126 篇）增加 5 篇。

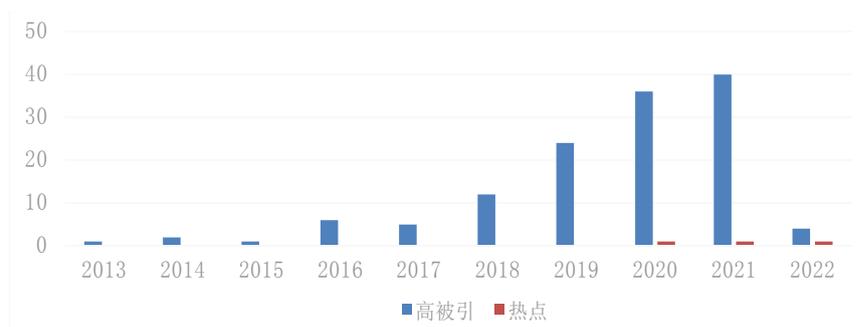


图 1 2022 年 5 月长安大学 ESI 高被引论文、热点论文的年代分布

这些 ESI 高被引论文分布在：工程学领域 40 篇，环境/生态科学领域 36 篇，地球科学领域 15 篇，化学领域 12 篇，社会科学总论 7 篇，材料科学领域 6 篇，经济与商业领域 5 篇，计算机科学领域 4 篇，数学领域 4 篇，农业科学领域 1 篇，心理学/精神病学领域 1 篇。我校作为第一作者单位发表的 ESI 高被引论文有 89 篇（其中包括作为第一通讯作者发表的 ESI 高被引论文 7 篇），作为合作单位发表的 ESI 高被引论文数为 42 篇。

本期我校 ESI 热点论文有 3 篇（与上期持平），2 篇为我校第一作者发表，1 篇为与其他单位合作发表。热点论文分布在：环境/生态科学领域 2 篇，工程学领域 1 篇，（详见本期长安大学 ESI 热点论文索引）。

## 2. 高被引、热点论文的院系分布

本期我校 131 篇 ESI 高被引论文的院系分布情况：水利与环境学院 51 篇（其中第一作者单位论文数 42 篇，合作发表论文数 9 篇；“第一作者单位”包括第一通讯作者单位，下同），位居首位；其次是公路学院 16 篇（其中第一作者单位论文数 10 篇，合作发表论文数 6 篇）；经济与管理学院 13 篇（其中第一作者单位论文数 6 篇，合作发表论文数 7 篇）；汽车学院 11 篇（其中第一作者单位论文数 10 篇，合作发表论文数 1 篇）；地质工程与测绘学院 11 篇（其中第一作者单位论文数 3 篇，合作发表论文数 8 篇）；信息工程学院 10 篇（其中第一作者单位论文数 7 篇，合作发表论文数 3 篇）；材料科学与工程学院 7 篇（其中第一作者单位论文数 2 篇，合作发表论文数 5 篇）；建筑工程学院 3 篇（其中第一作者单位论文数 3 篇）；工程机械学院 2 篇（其中第一作者单位论文数 1 篇，合作发表论文数 1 篇）；理学院 2 篇（其中第一作者单位论文数 1 篇，合作发表论文数 1 篇）；地球科学与资源学院 2 篇（其中第一作者单位论文数 1 篇，合作发

表论文数 1 篇)；建筑学院 1 篇(其中第一作者单位论文数 1 篇)，土地工程学院 1 篇(其中第一作者单位论文数 1 篇)，电子与控制工程学院 1 篇(其中第一作者单位论文数 1 篇)。

从 ESI 数据可以看出：本期长安大学高被引论文数量较上期增加 5 篇，总体维持上期水平。其中，水利与环境学院、信息工程学院、地质工程与测绘学院高被引文章数量均有增加；公路学院、汽车学院高被引文章数量略微有所下降。

值得注意的是：

本期我校社会科学总论(SOCIAL SCIENCES, GENERAL)首次进入世界排名前 1%，我校进入 ESI 学科全球排名前 1%的学科数增至 5 个；

本期土地工程学院、电子与控制工程学院均首次出现 ESI 高被引论文(近 21 期)，论文所属 ESI 学科分别为：环境/生态科学(Environment/Ecology)与地球科学(Geosciences)。

本期我校 ESI 热点论文 3 篇，较上期 3 篇持平，具体分布为经济与管理学院 1 篇、建筑工程学院 1 篇，均为第一作者发表，水利与环境学院 1 篇为合作完成。

我校近 21 期 ESI 高被引论文和 ESI 热点论文的院系分布变化情况可参考表 4 和表 5。

统计方法：下表在统计高被引论文和热点论文的学院分布时，未区分第一作者单位、通讯作者。

表4 近21期长安大学ESI高被引论文院系分布情况

ESI 更新时间	公路学 院	水利与 环境学 院	汽车学 院	信息工 程学院	地质工 程与测 绘学院	材料科 学与工 程学院	地球科 学与资 源学院	理学院	工程机 械学院	经济管 理学院	建筑工 程学院	人文学 院	建筑学 院	电子与 控制工 程学院	土地工 程学院
2019.1.19	19	10	6	4	3	3	2	1							
2019.3.14	15	11	6	4	4	3	1	1							
2019.5.9	23	11	6	4	4	3	1	1							
2019.7.11	26	10	5	9	6	2	1	1							
2019.9.11	37	18	7	7	6	3	1	2							
2019.11.15	41	29	8	8	5	1	2	2							
2020.1.9	39	28	12	6	6	2	2	2	1						
2020.3.12	36	25	9	8	6	2	2	2	1						
2020.5.14	28	35	8	8	6	3	2	3	2	1					

ESI 更新时间	公路学 院	水利与 环境学 院	汽车学 院	信息工 程学院	地质工 程与测 绘学院	材料科 学与工 程学院	地球科 学与资 源学院	理学院	工程机 械学院	经济管 理学院	建筑工 程学院	人文学 院	建筑学 院	电子与 控制工 程学院	土地工 程学院
2020.7.9	36	38	8	8	8	3	2	4	2	3					
2020.9.10	35	43	10	7	7	4	3	4	2						
2020.11.24	31	42	9	6	7	3	2	4	3	3					
2021.1.21	31	43	10	6	9	4	2	4	3	4	1				
2021.3.25	26	49	10	8	11	5	2	3	2	4	1				
2021.5.13	18	52	9	8	11	5	3	3	2	5					
2021.7.8	15	46	10	7	11	7	2	4	2	5					
2021.9.9	13	48	10	8	10	7	2	2	2	6					
2021.11.11	14	51	11	7	10	5	2	1	2	8	3				
2022.1.13	21	50	10	8	10	6	2	2	3	11	3	1			

ESI 更新时间	公路学 院	水利与 环境学 院	汽车学 院	信息工 程学院	地质工 程与测 绘学院	材料科 学与工 程学院	地球科 学与资 源学院	理学院	工程机 械学院	经济管 理学院	建筑工 程学院	人文学 院	建筑学 院	电子与 控制工 程学院	土地工 程学院
2022.3.10	19	48	12	8	9	7	2	2	2	13	3		1		
2022.5.12	16	51	11	10	11	7	2	2	2	13	3		1	1	1

表 5 近 21 期长安大学 ESI 热点论文院系分布情况

ESI 更新时间	公路学院	信息工程学院	汽车学院	地质工程与测绘学院	水利与环境学院	经济与管理学院	理学院	建筑工程学院
2019.1.19	2	2	1	1				
2019.3.14		1		1				
2019.5.9	6			2				
2019.7.11								无 ESI 热点论文
2019.9.11						4		
2019.11.15	1	1						

ESI 更新时间	公路学院	信息工程学院	汽车学院	地质工程与测绘学院	水利与环境学院	经济与管理学院	理学院	建筑工程学院
2020.1.9				1				
2020.3.12					1			
2020.5.14					7			
2020.7.9	5				2			
2020.9.10	1				7			
2020.11.24	2		1			1		
2021.1.21		1	1			1		
2021.3.25					3			
2021.5.13			1	1		2		
2021.7.8			2		1	2	1	
2021.9.9	1					3		
2021. 11. 11			1		1			1

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ESI 更新时间	公路学院	信息工程学院	汽车学院	地质工程与测绘学院	水利与环境学院	经济与管理学院	理学院	建筑工程学院
2022.1.13	2		1			2		1
2022.3.10					1	2		
2022.5.12					1	1		1

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### 3. 高被引论文作者

在本期 131 篇高被引文章中，89 篇为第一作者发表（包括通讯第一作者）。从 ESI 高被引论文的作者分布来看，共 57 位作者的文章进入各自领域前 1%，比上期增加 4 位；12 位作者 ESI 高被引文章  $\geq 2$  篇，作者数量与分布情况与上期大体相同；其余发文量、被引频次总体而言较为稳定。工作组对其院系分布、高被引论文数量（仅限第一作者署名第一单位为长安大学）进行了统计分析详见表 6。

表 6 2022 年 5 月长安大学 ESI 高被引论文作者分布情况  
(仅统计第一作者署名第一单位为长安大学的作者)

作者姓名	所属学院	高被引文章数量
Adimalla, Narsimha	水利与环境学院	9
Li, Peiyue	水利与环境学院	9
He, Xiaodong	水利与环境学院	4
Wu, Jianhua	水利与环境学院	4
Chen, Hao	汽车学院	3
Yu, Zhang	经济与管理学院	3
Chen, Jie	水利与环境学院	2
He, Siyue	公路学院	2
Li, Ang	公路学院	2
Wang, Chaohui	公路学院	2
Zhao, Xuan	汽车学院	2
Zhu, Qi	水利与环境学院	2
Chen, Zhanming	汽车学院	1
Ding, Kai	工程机械学院	1
Dong, Ming	信息工程学院	1
Fan, Xiang	公路学院	1
Gao, Yanyan	水利与环境学院	1
Gao, Ziqian	水利与环境学院	1
Geng, Limin	汽车学院	1
Guo, Jingru	水利与环境学院	1
Guo, Yajie	材料科学与工程学院	1

作者姓名	所属学院	高被引文章数量
He, Jiaojie	建筑工程学院	1
He, Song	水利与环境学院	1
Heng, Ziling	理学院	1
Huang, Hua	建筑工程学院	1
Hui, Fei	信息工程学院	1
Ji, Yujie	水利与环境学院	1
Kang, LiuWang	汽车学院	1
Leng, Yanqiu	地质工程与测绘学院	1
Li, Lin	公路学院	1
Li, Wei	信息工程学院	1
Li, Yi	经济与管理学院	1
Peng, Jianbing	地质工程与测绘学院	1
Quan, Siwen	电子与控制工程学院	1
Sun, Shijie	信息工程学院	1
Wang, Dan	水利与环境学院	1
Wang, Liping	水利与环境学院	1
Wang, Qizhao	水利与环境学院	1
Wang, Yang	地球科学与资源学院	1
Wang, Zhichao	公路学院	1
Wei, Miaojun	水利与环境学院	1
Wei, Xindong	土地工程学院	1
Xie, Shaobo	汽车学院	1
Xu, Zhigang	信息工程学院	1
Yu, Kan Hua	建筑学院	1
Zhang, Jingxiao	经济与管理学院	1
Zhang, Jiupeng	公路学院	1
Zhang, W. X.	材料科学与工程学院	1
Zhang, Wei	信息工程学院	1
Zhang, Yuting	水利与环境学院	1

作者姓名	所属学院	高被引文章数量
Zhao, Chuanliang	建筑工程学院	1
Zhao, Xiangmo	信息工程学院	1
Zheng, Mingbo	经济与管理学院	1
Zhou, Luping	水利与环境学院	1
Zhou, Shiqian	水利与环境学院	1
Zhu, Guohua	汽车学院	1
Zhuang, Jianqi	地质工程与测绘学院	1

#### 4. 高被引论文来源期刊

我们对 131 篇 ESI 高被引论文的来源期刊进行分析后, 统计了 76 种来源期刊的名称、发文数量和影响因子 (表 7)。其中, *EXPOSURE AND HEALTH* 是我校 ESI 高被引论文发文量最高的期刊, 影响因子为 11.422, 发表高被引论文为 13 篇; 影响因子最高的期刊为 *APPLIED CATALYSIS B-ENVIRONMENTAL*, 影响因子高达 19.503, 发表的高被引论文有 8 篇。通过期刊规范化的引文影响力 (Journal Normalized Citation Impact, JNCI) 数值可以看到, 我校 ESI 高被引论文来源期刊的 JNCI 值都大于 1, 表明我校高被引论文的影响力均高于这些期刊的平均影响力。图 2 展示了我校 131 篇 ESI 高被引论文的 76 种来源期刊的分区占比情况, 其中 Q1 区的占比最高 (75%), Q2 区其次, 两个区的占比达 93.15% (上期为 93.42% 左右), Q3 区占比 6.58%, 无 Q4 区期刊, 这表明我校本期 ESI 高被引论文来源期刊的质量有了较大幅度的提升。

表 7 长安大学 ESI 高被引论文的 76 种来源期刊列表 (按被引频次排序)

期刊名称	按被引频次的排名	Web of Science 论文数	被引频次	期刊影响因子分区	期刊影响因子	5 年影响因子	期刊规范化的引文影响力
EXPOSURE AND HEALTH	1	13	1735	Q1	11.422	9.981	6.638
HUMAN AND ECOLOGICAL RISK ASSESSMENT	2	6	643	Q1	5.19	3.742	9.985
APPLIED CATALYSIS B-ENVIRONMENTAL	3	8	540	Q1	19.503	17.291	2.495
JOURNAL OF HAZARDOUS MATERIALS	4	4	420	Q1	10.588	10.129	3.515
APPLIED ENERGY	5	3	307	Q1	9.746	9.953	6.18
ENVIRONMENTAL EARTH SCIENCES	6	2	279	Q2	2.784	2.867	18.58
NANO ENERGY	7	2	272	Q1	17.881	17.631	6.185

期刊名称	按被引频 次的排名	Web of Science 论文数	被引频次	期刊影响 因子分区	期刊影响 因子	5 年影响 因子	期刊规范化 的引文影响 力
ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH	8	2	265	Q2	4.223	4.306	13.125
ENGINEERING GEOLOGY	9	4	241	Q1	6.755	7.138	5.5425
JOURNAL OF CLEANER PRODUCTION	9	4	241	Q1	9.297	9.444	4.725
CHEMICAL ENGINEERING JOURNAL	11	2	234	Q1	13.273	11.529	3.165
SCIENCE OF THE TOTAL ENVIRONMENT	12	2	209	Q1	7.963	7.842	5.865
ACS NANO	13	2	203	Q1	15.881	16.207	3.555
JOURNAL OF MATERIALS CHEMISTRY A	14	1	191	Q1	12.732	11.995	4.96
ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY	15	3	186	Q1	6.291	6.393	7.83
ENVIRONMENTAL GEOCHEMISTRY AND HEALTH	16	3	180	Q1	4.609	4.677	9.68
ARABIAN JOURNAL OF GEOSCIENCES	17	1	173	Q3	1.827	1.985	23.18
TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY	18	4	170	Q1	5.915	6.255	16.27
ENERGY	19	2	162	Q1	7.147	6.845	4.62
GEOCHIMICA ET COSMOCHIMICA ACTA	20	1	158	Q1	5.01	5.497	4.2
MINE WATER AND THE ENVIRONMENT	21	1	136	Q2	2.883	2.725	12.09
SCIENCE BULLETIN	22	1	129	Q1	11.78	7.658	5.56
CATENA	23	1	125	Q1	5.198	5.594	7.55
TRANSPORTATION RESEARCH PART C-EMERGING TECHNOLOGIES	24	1	124	Q1	8.089	8.795	4.34
INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	25	1	123	Q1	8.568	6.715	8.12
GEOMATICS NATURAL HAZARDS & RISK	26	1	112	Q2	3.528	4.008	6.42
APPLIED THERMAL ENGINEERING	27	1	111	Q1	5.295	5.175	6.59
GEOCHEMISTRY	28	2	109	Q3	2.292	2.292	8.62
APPLIED AND COMPUTATIONAL MATHEMATICS	29	1	104	Q1	3.898	2.752	8.07
SUSTAINABLE DEVELOPMENT	30	2	103	Q1	6.159	6.427	7.31
INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	31	1	101	Q1	3.39	3.789	10.31
MEDITERRANEAN JOURNAL OF MATHEMATICS	32	1	98	Q2	1.4	1.418	15.61
JOURNAL OF PHYSICAL CHEMISTRY LETTERS	33	1	97	Q1	6.475	7.643	6.24
TRANSPORTATION RESEARCH PART	34	2	87	Q1	5.495	6.229	4.265

期刊名称	按被引频 次的排名	Web of Science 论文数	被引频次	期刊影响 因子分区	期刊影响 因子	5 年影响 因子	期刊规范化 的引文影响 力
D-TRANSPORT AND ENVIRONMENT							
KNOWLEDGE-BASED SYSTEMS	35	1	85	Q1	8.038	7.842	4.46
IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS	36	1	81	Q1	8.236	8.882	7.04
RISK ANALYSIS	37	1	79	Q1	4	4.155	9.36
ENERGY STORAGE MATERIALS	38	1	72	Q1	17.789	17.712	2.71
INTERNATIONAL JOURNAL OF GEOMECHANICS	39	1	71	Q2	3.819	3.969	8.41
JOURNAL OF ENVIRONMENTAL MANAGEMENT	40	1	63	Q1	6.789	6.914	6.21
JOURNAL OF ASIAN EARTH SCIENCES	41	1	62	Q2	3.449	3.96	8.78
INTERNATIONAL JOURNAL OF LOGISTICS-RESEARCH AND APPLICATIONS	42	2	60	Q3	3.821	4.381	11.965
FILOMAT	42	1	60	Q3	0.844	0.95	17.24
ENERGY CONVERSION AND MANAGEMENT	44	1	54	Q1	9.709	8.954	4.1
SUSTAINABLE CITIES AND SOCIETY	44	1	54	Q1	7.587	7.308	3.91
IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE	46	1	52	Q1	16.389	18.46	3.44
INTERNATIONAL JOURNAL OF IMPACT ENGINEERING	47	1	51	Q1	4.208	4.768	9.65
IEEE SENSORS JOURNAL	47	1	51	Q2	3.301	3.441	9.88
GEOSCIENCE FRONTIERS	49	1	49	Q1	6.853	6.791	7.71
JOURNAL OF HYDROLOGY	50	1	48	Q1	5.722	6.033	6.15
ENGINEERING	51	1	46	Q1	7.553	8.977	14.38
JOURNAL OF BUILDING ENGINEERING	52	2	45	Q1	5.318	5.146	11.25
STRUCTURAL CONTROL & HEALTH MONITORING	53	1	44	Q1	4.819	4.76	7.75
FINITE FIELDS AND THEIR APPLICATIONS	54	1	43	Q1	1.773	1.797	7.96
IEEE INTERNET OF THINGS JOURNAL	55	1	32	Q1	9.471	10.127	8.23
ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING	55	1	32	Q1	5.666	5.67	10.97
OPERATIONS MANAGEMENT RESEARCH	57	1	31	Q3	2.706	4.633	12.26
COMPUTERS AND GEOTECHNICS	58	1	28	Q1	4.956	5.501	17.79
JOURNAL OF AFFECTIVE DISORDERS	59	1	27	Q1	4.839	5.515	14.16
ACS SUSTAINABLE CHEMISTRY & ENGINEERING	60	1	26	Q1	8.198	8.471	11.73
BUSINESS STRATEGY AND THE ENVIRONMENT	61	1	25	Q1	10.302	11.923	7.99
PLOS ONE	61	1	25	Q2	3.24	3.788	25.13
ENGINEERING WITH COMPUTERS	63	1	24	Q1	7.963	6.544	3.62

期刊名称	按被引频次的排名	Web of Science 论文数	被引频次	期刊影响因子分区	期刊影响因子	5 年影响因子	期刊规范化的引文影响力
JOURNAL OF THE ENERGY INSTITUTE	64	1	23	Q2	6.186	5.912	10.1
ENGINEERING FAILURE ANALYSIS	65	1	22	Q2	3.114	3.233	18.12
EMERGING MARKETS FINANCE AND TRADE	66	1	21	Q2	2.315	2.004	19.41
CHEMOSPHERE	66	1	21	Q1	7.086	6.956	2.3
SUSTAINABILITY	68	1	19	Q2	3.251	3.473	15.6
CHEMICAL SCIENCE	68	1	19	Q1	9.825	9.658	6.27
THEORETICAL AND APPLIED FRACTURE MECHANICS	70	1	17	Q1	4.017	3.577	10.19
JOURNAL OF CONSTRUCTIONAL STEEL RESEARCH	70	1	17	Q1	3.646	4.047	13.69
NATURAL RESOURCES RESEARCH	72	1	16	Q1	5.146	4.269	7.17
ROCK MECHANICS AND ROCK ENGINEERING	73	1	15	Q1	6.73	7.381	9.03
ENVIRONMENTAL IMPACT ASSESSMENT REVIEW	74	1	14	Q2	4.549	5.08	4.66
IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING	75	2	8	Q1	5.6	6.086	3.8
IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS	76	1	3	Q1	6.492	7.253	1.91



图 2 长安大学 131 篇 ESI 高被引论文来源期刊的影响因子分区占比图

## 二. 我校 ESI 前 1% 学科概况与优势学科预测

本期我校有五个学科进入 ESI 全球前 1%: 工程学、地球科学、材料科学、环境/生态科学和社会科学总论, 其中, **社会科学总论为首次进入 ESI 前 1%。**

### 1. 工程学

本期我校在工程学领域共发表 ESI 论文 3,298 篇 (ESI 高被引论文 40 篇, 热点论文 1 篇), 总被引次数为 24,167 次, 篇均被引 7.33 次。本期全球有 1,928 所机构 (中国机构 372 所) 进入工程学 ESI 全球排名前 1% 行列, 我校位列 396 位 (在中国机构中位列 87 位), 全球排位百分比 20.54% (较上期排位上升 1.63%), **进入全球工程学 ESI 机构排名前千分之三。**表 8 为近 21 期我校工程学 Web of Science 发文量、被引频次以及 ESI 排名情况。

表 8 长安大学工程学发文量、被引频次以及 ESI 排名情况 (近 21 期数据比较)

序号	数据更新时间	中国机构排名	ESI 全球排名	论文数	被引频次
1	2019.1.19	121	879	1,080	4,880
2	2019.3.14	122	863	1,140	5,283
3	2019.5.9	120	790	1,190	5,578
4	2019.7.11	126	769	1,276	6,153
5	2019.9.11	122	747	1,386	6,686
6	2019.11.15	120	723	1,489	7,338
7	2020.1.9	119	714	1,576	8,011
8	2020.3.12	118	701	1,680	8,799
9	2020.5.14	113	635	1,772	9,127
10	2020.7.9	110	608	1,917	10,156
11	2020.9.10	110	599	2,048	11,098
12	2020.11.24	110	587	2,207	12,192
13	2021.1.21	105	565	2,368	13,463
14	2021.3.25	99	545	2,502	14,631
15	2021.5.13	96	506	2,593	15,124
16	2021.7.8	93	485	2,723	16,476
17	2021.9.9	91	473	2,842	17,935
18	2021.11.11	90	459	2,968	19,495
19	2022.1.13	89	441	3,091	21,176
20	2022.3.10	88	433	3,222	23,111
21	2022.5.12	87	396	3,298	24,167

注: 中国机构包括了中国大陆机构和港、澳、台地区机构。下同。

## 2. 地球科学

本期我校在地球科学领域共发表 ESI 论文 1,763 篇 (ESI 高被引论文 15 篇), 总被引次数为 16,003 次, 篇均被引 9.08 次。本期全球有 891 所机构 (中国机构 99 所) 进入地球科学 ESI 全球排名前 1% 行列, 我校位列 481 位 (中国机构中位列 53 位), 全球排位 53.98% (比上期提升约 2.8%)。进入全球地球科学 ESI 机构排名前千分之六。表 9 为近 16 期我校地球科学 Web of Science 发文量、被引频次以及 ESI 排名情况。

表 9 长安大学地球科学发文量、被引频次以及 ESI 排名情况 (近 16 期数据比较)

序号	数据更新时间	中国机构排名	ESI 全球排名	论文数	被引频次
1	2019.11.15	98	717	897	6,813
2	2020.1.9	61	672	950	7,295
3	2020.3.12	61	665	1,003	7,802
4	2020.5.14	56	617	1,035	7,830
5	2020.7.9	59	612	1,086	8,374
6	2020.9.10	57	605	1,151	8,970
7	2020.11.24	57	605	1,194	9,589
8	2021.1.21	56	596	1,256	10,371
9	2021.3.25	54	589	1,321	11,117
10	2021.5.13	54	543	1,365	11,320
11	2021.7.7	54	540	1,434	12,072
12	2021.9.9	54	529	1,501	12,903
13	2021.11.11	54	523	1,571	13,776
14	2022.1.13	54	522	1,650	14,660
15	2022.3.10	54	511	1,707	15,642
16	2022.5.12	53	481	1,763	16,003

## 3. 材料科学

本期我校在材料科学领域共发表 ESI 论文 1,894 篇 (ESI 高被引论文 6 篇), 总被引次数为 18,858 次, 篇均被引 9.96 次。本期全球有 1118 所机构 (中国机构 255 所) 进入材料科学 ESI 全球排名前 1% 行列, 我校位列 581 位 (中国机构中位列 149 位), 全球排位 51.97% (比上期提升 3.15%)。进入全球材料科学 ESI 机构排名前千分之六。表 10 为近 14 期我校材料科学 Web of Science 发文量、被引频次以及 ESI 排名情况。

表 10 长安大学材料科学发文量、被引频次以及 ESI 排名情况 (近 14 期数据比较)

序号	数据更新时间	中国机构排名	ESI 全球排名	论文数	被引频次
1	2020.3.12	167	921	1,081	7,103
2	2020.5.14	188	876	1,107	7,117
3	2020.7.9	177	828	1,196	8,020
4	2020.9.10	176	808	1,258	8,797
5	2020.11.24	173	790	1,326	9,625
6	2021.1.21	172	772	1,396	10,538
7	2021.3.25	169	740	1,461	11,610
8	2021.5.13	166	690	1,507	11,995
9	2021.7.7	164	678	1,572	13,075
10	2021.9.9	164	666	1,624	14,011
11	2021.11.11	164	658	1,693	15,056
12	2022.1.13	160	636	1,767	16,307
13	2022.3.10	154	624	1,838	17,724
14	2022.5.12	149	581	1,894	18,858

#### 4. 环境/生态科学

本期我校在环境/生态科学领域共发表 ESI 论文 1,099 篇 (ESI 高被引论文 36 篇, 热点论文 2 篇), 总被引次数为 14,678 次, 篇均被引 13.36 次。本期全球有 1,468 所机构 (中国机构 193 所) 进入环境/生态科学 ESI 全球排名前 1% 行列, 我校位列 650 位 (中国机构中位列 67 位), 全球排位 44.28% (比上期提升 4.83%)。进入全球环境/生态科学 ESI 机构排名前千分之五 (上期为进入排名前千分之六)。表 11 为近 13 期我校环境/生态科学 Web of Science 发文量、被引频次以及 ESI 排名情况。

表 11 长安大学环境/生态科学发文量、被引频次以及 ESI 排名情况 (近 13 期数据比较)

序号	更新时间	中国大陆机构排名	ESI 全球排名	论文数	被引频次
1	2020.5.14	92	971	632	5,085
2	2020.7.9	81	942	679	5,615
3	2020.9.10	89	897	728	6,347
4	2020.11.24	88	887	773	6,920
5	2021.1.21	86	870	816	7,575
6	2021.3.25	84	848	839	8,346
7	2021.5.13	80	760	869	9,106
8	2021.7.7	84	766	912	10,069
9	2021.9.9	82	752	957	10,899
10	2021.11.11	82	747	989	11,692
11	2022.1.13	82	741	1,022	12,589
12	2022.3.10	80	718	1,066	13,596
13	2022.5.12	67	650	1,099	14,678

## 5. 社会科学总论

本期我校新增一个进入 ESI 全球机构排名前 1% 的学科：社会科学总论。我校在社会科学总论领域共发表 ESI 论文 209 篇（ESI 高被引论文 7 篇），总被引次数为 1,724 次，篇均被引 8.25 次。本期全球有 1,857 所机构（中国机构 130 所）进入社会科学总论 ESI 全球排名前 1% 行列，我校位列 1848 位（中国机构中位列 130 位）。

## 6. 优势学科分析

表 12 为 2012-2022 年（统计时采用的 Incites 数据库更新时间为 2022.4.29）我校 ESI 各学科的发文情况，可以看到工程学、材料科学、地球科学、环境/生态科学为我校的优势学科，其在发文数量、被引频次和学科规范化的引文影响力（Category Normalized Citation Impact, CNCI）值上均具有一定的影响力；化学、物理学、计算机科学、社会科学总论等学科为我校的潜力发展学科，本期社会科学总论实现了进入全球 ESI 排名前 1% 的突破，化学、物理学、计算机科学要实现突破仍需要一定的努力；其他领域研究发文数量和被引频次相对较少。

表 12 长安大学 2011-2022 年 ESI 各学科发文概况

学科名称	排名	Web of Science 论文数	被引频次	学科规范化的引文影响力	论文被引百分比 (%)
Engineering	1	3339	25858	1.01	74.69
Materials Science	2	1921	19706	0.85	82.04
Geosciences	3	1785	16580	1.04	80.06
Environment/Ecology	4	1118	15352	1.62	80.95
Chemistry	5	728	8230	1.04	85.03
Physics	6	340	2470	0.64	78.53
Computer Science	7	319	2147	0.90	69.91
Social Sciences, general	8	210	1827	2.12	75.71
Mathematics	9	191	881	1.25	63.87
Agricultural Sciences	10	68	651	1.35	72.06
Biology & Biochemistry	11	49	562	1.33	87.76
Economics & Business	12	50	427	3.10	70
Space Science	13	46	358	0.48	84.78
Plant & Animal Science	14	32	262	0.76	71.88
Clinical Medicine	15	32	171	0.51	68.75
Pharmacology & Toxicology	16	9	161	1.76	100
Psychiatry/Psychology	17	26	143	1.40	76.92
Microbiology	18	6	110	1.06	66.67
Neuroscience & Behavior	19	14	98	0.34	71.43

学科名称	排名	Web of Science 论文数	被引频次	学科规范化的引文影响力	论文被引百分比 (%)
Immunology	20	3	37	0.78	100
Multidisciplinary	21	9	33	0.20	44.44
Molecular Biology & Genetics	22	3	16	0.15	66.67

注：选取的是 Article 和 Review 类型的文献做统计

我们对发文量前 9（考虑到这几个 ESI 学科涉及到了我校相关研究领域）的 ESI 学科进行了分析，可以看出工程学的发文量、被引频次仍为最高，一直保持着较为稳定的发展趋势；材料科学的发文量、被引频次次之，近几期一直处于相对稳定的态势；地球科学发文量、被引频次位于第三，发展态势稳定；环境/生态科学的被引频次一直较为突出。

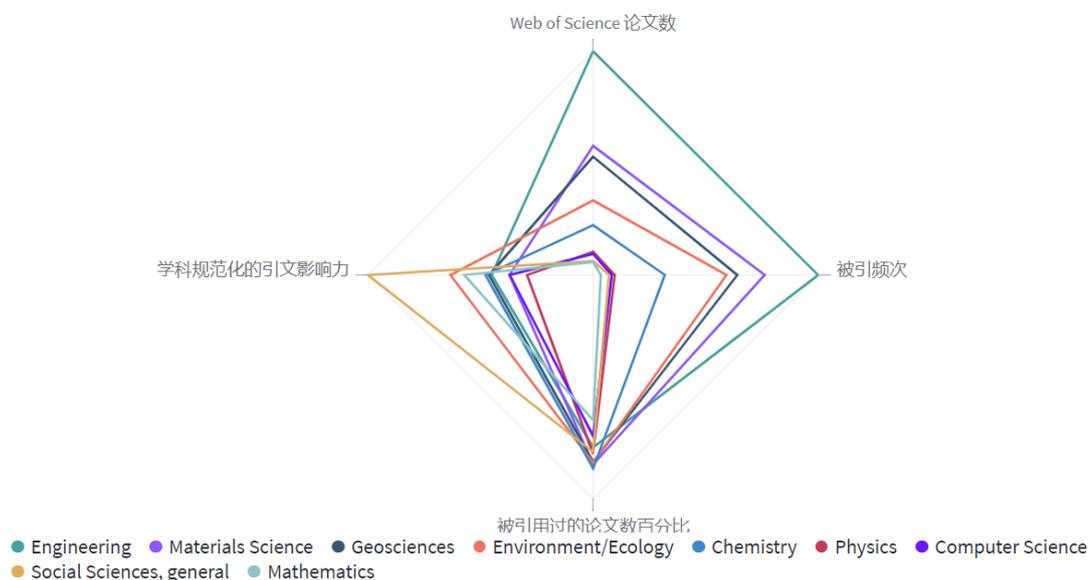
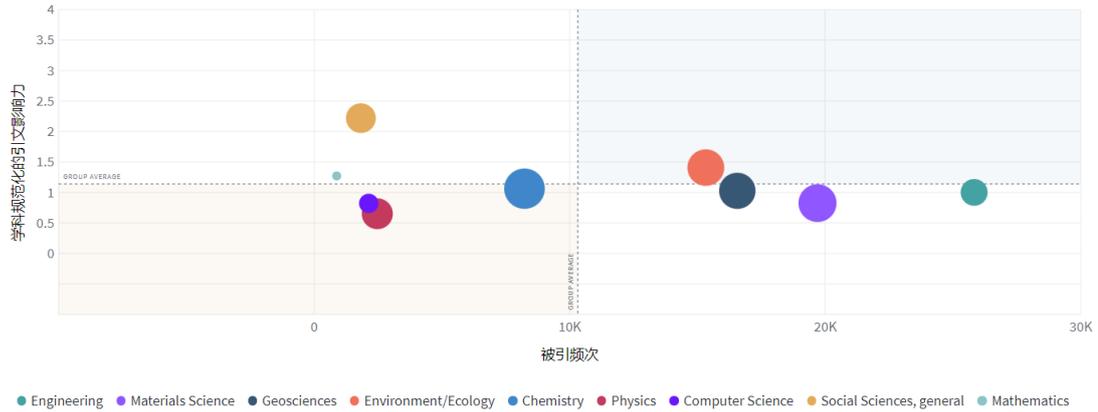


图 3 长安大学发文量前 9 的 ESI 学科发文量、被引频次、CNCI、论文被引百分比的雷达图

从图 4 可以看到，已进入全球排名前 1% 的工程学、地球科学、材料科学、环境/生态科学为我校优势学科；社会科学总论虽然发表论文总数与被引频次不算很高，但本期已进入 ESI 全球排名前 1%；化学学科的发文量、被引频次排在第 5 位，属于潜力优势学科，而且其 CNCI 值超过 1，表明我校这个领域的研究水平已经达到国际平均水平；其中特别值得注意的是：经济与商业领域的 CNCI 值是我校 22 个 ESI 学科中最高的，达到了 3.1 左右；社会科学总论领域的 CNCI 值也很高，已达 2.12，表明我校在这两个学科领域的研究已达到国际平均水平，也是我校的潜力发展学科领域。



注：图中点的半径表示该领域论文被引的百分比

图 4 2011-2022 年长安大学发文量 TOP9 的 ESI 学科的 CNCI 值表现情况

### 7. 潜力学科预测

在将 22 个 ESI 学科的阈值与我校各学科的被引频次进行比较后，我们进一步对具有进入全球前 1% 潜力的学科进行了预测（图 5），从图中可以看出，化学学科与 ESI 全球前 1% 的机构阈值接近度已达 96.46% 左右（比上一期接近度提升约 4.5% 左右），是我校下一个有望突破 ESI 全球前 1% 的学科，需要全校相关研究领域的科研人员继续努力，以提高发文数量和被引频次；同时看到计算机科学与 ESI 全球前 1% 的机构阈值接近度已达 48% 左右，也有很大的发展空间。

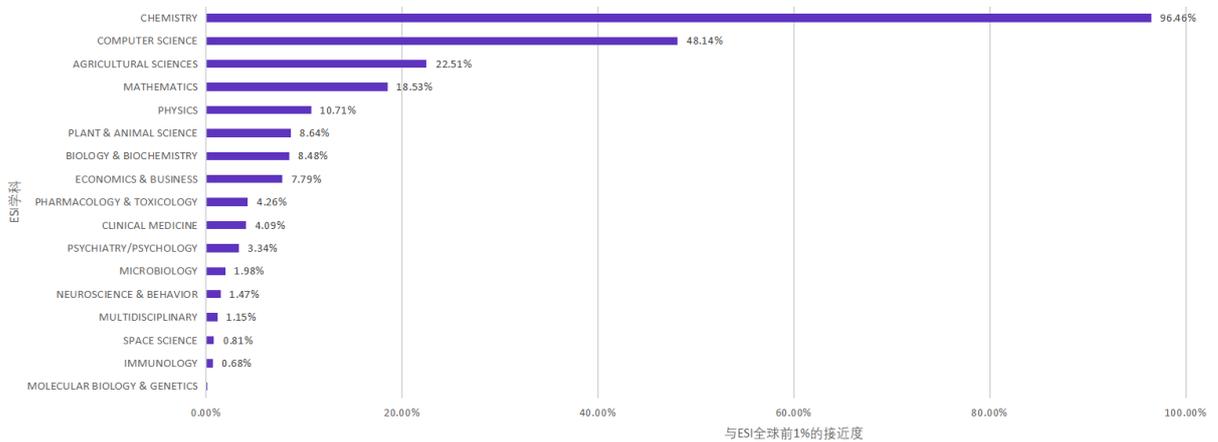


图 5 长安大学具有潜力进入 ESI 全球前 1% 的学科预测情况

注：由于 Incites 数据库与 ESI 数据库更新时间不同，数据预测与实际结果存在正常范围内的误差，预测结果仅供参考。

## 学科研究前沿动态

研究前沿可以从一个独特的视角来揭示科学研究的脉络。“学科研究前沿”栏目基于我校图书馆所购买的数字资源，利用文献计量方法，从重要数据库中组织整理出与我校学科领域相关的最新学科热点研究论文、最新学科研究前沿等信息，以期为我校师生开展学术研究活动提供有价值的参考信息。

本期收集整理了如下热点论文和前沿信息：

1.全球性信息分析公司爱思唯尔(Elsevier)发布的 2021 “中国高被引学者”(Highly Cited Chinese Researchers)榜单中长安大学 4 名高被引作者研究概况推介。

2. Nature Latest Research。选取 Nature 子刊中 Nature Chemistry（化学综合学科）、Nature Climate Change（环境科学学科）、Nature Geoscience（地球科学综合学科）、Nature Nanotechnology（材料科学综合学科）四个子刊中 2022 年 4 月、5 月（截止 13 号）的最新研究论文，以供参考。

本栏目编辑：尹莉 张志惠

## 一. 爱思唯尔 2021 “中国高被引学者”榜单长安大学高被引作者

4 月 14 日, 全球性信息分析公司爱思唯尔 (Elsevier) 正式发布了 2021 “中国高被引学者” (Highly Cited Chinese Researchers) 榜单。中国高被引学者从纯论文影响力的角度遴选学术人才, 标准客观统一, 有利于从多元视角看待人才, 具有重要的参考价值, 也被采用作为软科中国大学排名的重要评价指标。

2021 爱思唯尔 “中国高被引学者” 榜单以全球权威的引文与索引数据库 Scopus 作为中国学者科研成果的统计来源, 采用软科 (上海软科教育信息咨询有限公司) 设计的遴选方法, **最终得到 4701 名各学科最具全球影响力的中国学者。**

2021 年 “中国高被引学者” 榜单覆盖了教育部 10 个学科门类的 84 个一级学科, 并且对高被引学者基础数据的提取使用了教育部一级学科分类映射 (已覆盖 111 个学科), 这样文章级别的学科映射使得中国学者的学科归属、学科表现等方面的数据更加直观地展现了契合中国学科设置的学术研究生态, 完善并科学、精确地描绘了中国学者的科研产出, 为进一步梳理、分析和研究学者引用表现提供了有效帮助。

2021 年中国高被引学者来自 523 所高校、企业和科研机构, 中国科学院 (其各科研院所合并同统计) 拥有最多的高被引学者, 共 458 位。其中共 319 所高校有学者入选, 6 所大学的高被引学者数量超过了 100 位。入选的学者共分布在 84 个不同的学科, 其中化学学科高被引学者最多, 共 377 位; 生物学、材料科学与工程、临床医学、物理学等学科均超过了 200 位。

长安大学在本次 “中国高被引学者” 榜单中共有 4 名高被引学者, 分别为: 彭建兵、汪海年、李培月、吴建华, 涉及的学科分别为: 地质资源与地质工程、交通运输工程、水利工程。

### 1. 彭建兵

根据 scopus 数据库检索记录, 彭建兵院士目前共发表研究论文 238 篇, 被 2317 篇论文共计引用 3760 次, h 指数为 33。

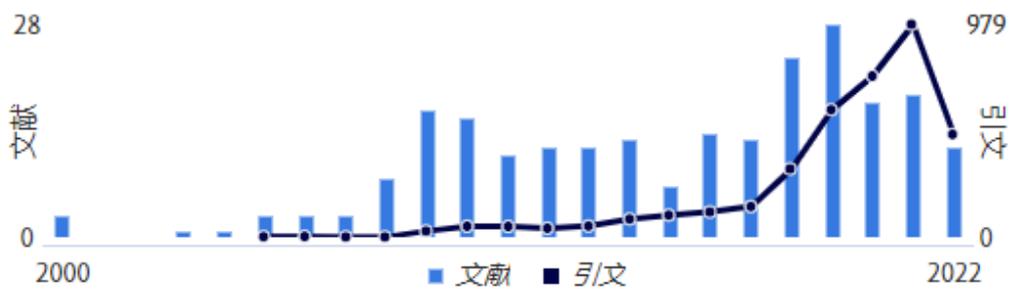


图 1 彭建兵院士发表文献与引用趋势图

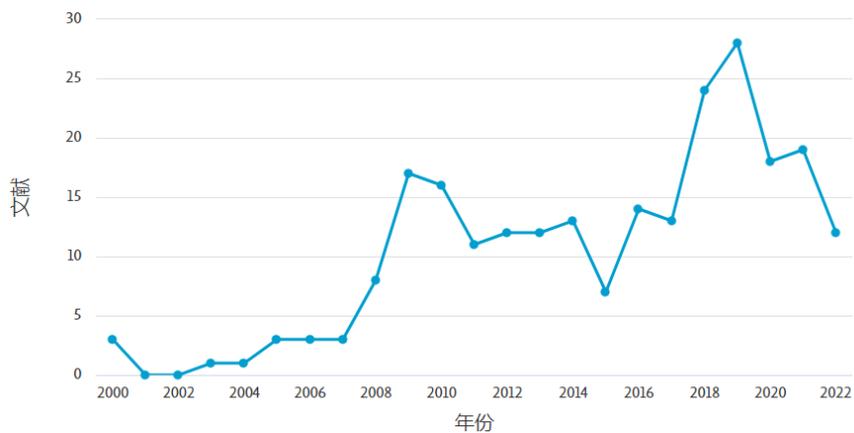


图 2 彭建兵院士发表文献年份分布图

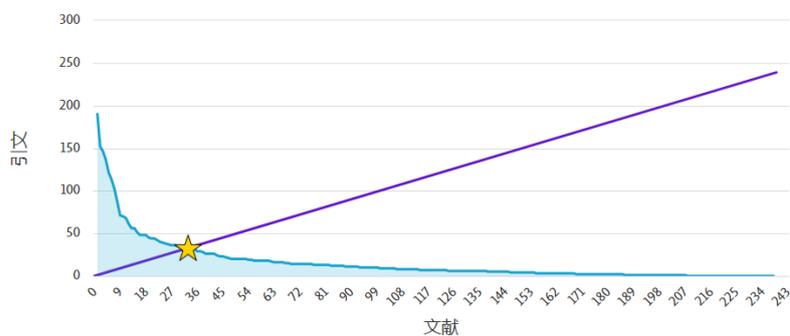


图 3 彭建兵院士 h 指数图

下表 1 和图 4 展示了近十年来彭建兵院士的主要研究主题以及在全球的显著度情况。

表 1 彭建兵院士近 10 年 (2011-2020) 研究主题概况

主题	主题编号	论文 产出数	FWCI (Field-Weighted Citation Impact)	显著度占位
China; Dewatering; Confined Aquifer	T.10732	33	1.22	96.319
Loess; Landslides; Irrigation	T.45225	25	2.47	84.286
Loess; Collapsibility; Sediment	T.18636	14	0.6	82.217
Landslides; Debris Flow; Susceptibility	T.446	8	4.88	99.872
Fissures (Geology); Fractal Dimension; Tunnels	T.49675	8	0.32	45.117
Debris Flow; Rock Avalanche; China	T.1719	6	2.27	98.064
Earthquake; Landslides; Debris Flow	T.6948	5	1.37	94.848
Seismic Response; Earthquake; Subway Stations	T.8904	5	0.55	95.975
Insar; Monitoring; Subsidence	T.1716	4	2.31	99.142
Landslides; Dams; Rock Avalanche	T.25377	4	1.77	85.811
Desiccation; Soil Cracks; Crack	T.11376	2	0.79	90.354
Eikonal Equation; Fast; Sweeping	T.13125	2	0.35	79.058
Richards Equation; Infiltration; Wetting Front	T.13589	2	2.67	78.87
Graben; Earthquake; Piedmont	T.17508	2	0.65	65.633
Freeze-thaw Cycles; Melting; Thaw	T.36453	2	0.48	81.577
Unsaturated Soil; Soil Water Characteristic; Suction	T.366	1	0	98.288
Biochar; Soil; Black Carbon	T.401	1	1.79	99.969
Sand; Cone Penetration Test; Void Ratio	T.516	1	0.15	97.852
Indian Plate; China; Wenchuan Earthquake	T.935	1	3.21	95.69
Ground Settlement; Excavation; TBM	T.1639	1	0.13	97.77
Confining Pressure; Crack Propagation; Damage	T.2694	1	0.26	99.38
Magnetism; Paleosols; Loess	T.2770	1	0.21	95.937
Sediment; Erodibility; Soil Erosion	T.3409	1	1.22	96.119
GRACE; Groundwater; Water Storage	T.4606	1	0.95	98.297
Oil Shale; Kerogen; Pyrolysis	T.6813	1	0.2	91.907
Permafrost; Embankments; Subgrade	T.7470	1	1.94	90.883
Compressive Strength; Dry Density; Limes	T.7887	1	1.86	97.401
Earth Pressure; Retaining Walls; Seismic	T.8019	1	1.14	89.707
Soil; Arching; Anchor Cables	T.10188	1	0.83	84.997
Infiltrimeters; Soil Hydraulic Properties; Infiltration	T.12228	1	0.1	91.924
Landslides; Soil; Slope Stability	T.20127	1	1.42	76.519
Landslides; Gorge; Water Levels	T.23148	1	0.74	87.173
Response Analysis; Layered Soils; Shear Modulus	T.24356	1	0	66.83
China; GPS; Collocation	T.24821	1	1.79	43.177

主题	主题编号	论文产出数	FWCI (Field-Weighted Citation Impact)	显著度占比
Underground; Urban Planning; Tunnels	T.29188	1	0.4	88.562
Magnetism; Discrete Elements; Cilia	T.31072	1	0.82	64.873
Rock Avalanche; Landslides; Rock	T.33728	1	0.18	63.156
Soil Micromorphology; Soft Clays; Microstructure	T.37717	1	0	65.293
China; Flood Routing; Rainstorms	T.38355	1	0.57	68.465
Dilatancy; Loess; Unloading	T.39579	1	2.03	43.954
Landslides; Elasto-Plastic; Slope Failure	T.43063	1	17.22	30.312
Distillation Columns; Non-Stationary Time Series; Polynomial Chaos	T.73269	1	0	6.084
Internet of Things; Seismic; Cloud Computing	T.86909	1	6.19	41.96

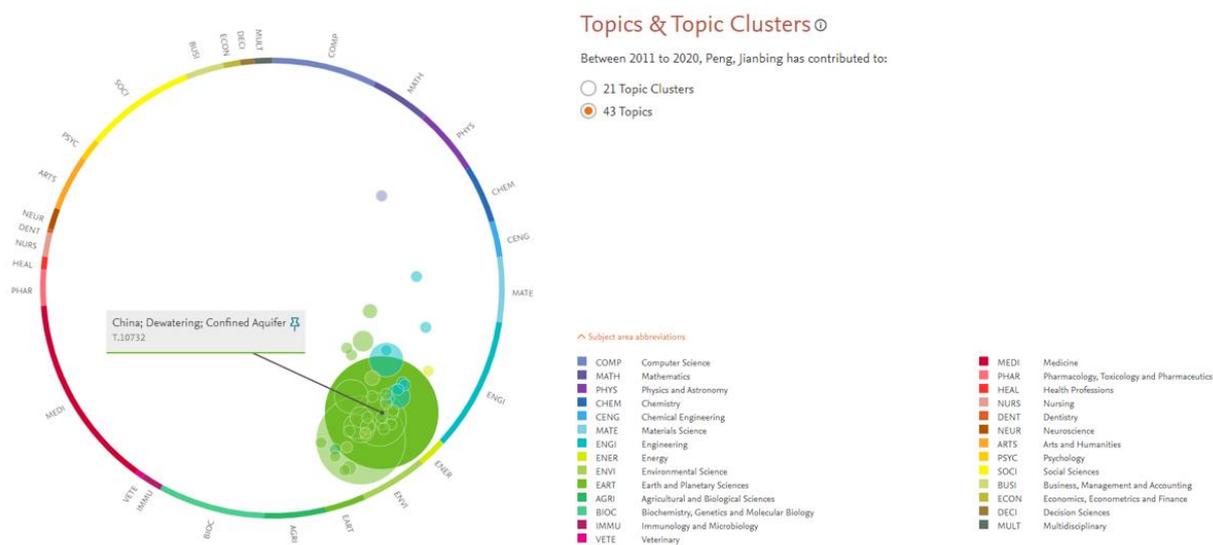


图 4 彭建兵院士近十年（2011-2020）研究主题

## 2. 汪海年

根据 scopus 数据库检索记录，汪海年教授目前共发表研究论文 158 篇，被 2065 篇论文共计引用 2762 次，h 指数为 30。

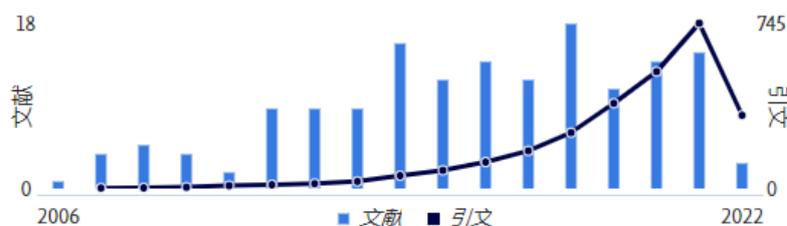


图 5 汪海年教授发表文献与引用趋势图

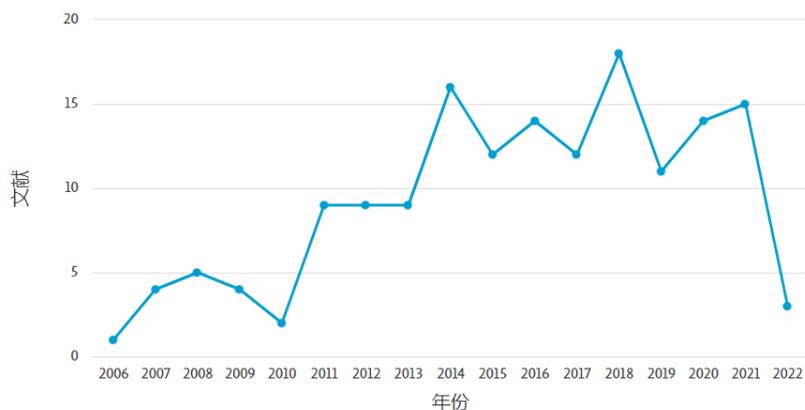


图 6 汪海年教授发表文献年份分布图

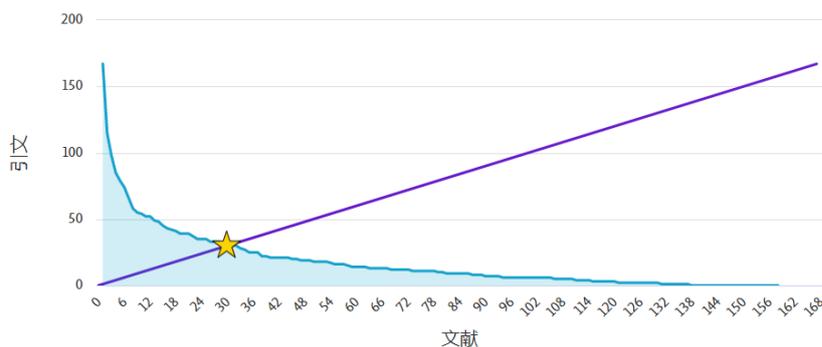


图 7 汪海年教授 h 指数图

下表 2 和图 8 展示了近十年来汪海年教授的主要研究主题以及在全球的显著度情况。

表 2 汪海年教授近 10 年（2011-2020）研究主题概况

主题	主题编号	论文 产出数	FWCI (Field-Weighted Citation Impact)	显著度占位
Asphalt Mixtures; Rutting; Asphalt	T.3247	44	2.19	99.348
Asphalt Mixtures; Compaction; Discrete Element Analysis	T.5572	22	1.73	97.011
Asphalt Mixtures; Mastic; Asphalt	T.9610	7	0.59	96.421
Asphalt Mixtures; Asphalt; Bitumens	T.1053	5	1.17	99.582
Phase Change Materials; Hot Temperature; Octadecane	T.719	4	0.63	99.884
Asphalt Mixtures; Superpave; Asphalt	T.14601	4	1.11	93.213
Shape-Memory Polymer; Shape Optimization; Polyurethan	T.1347	3	0.07	99.647
Permafrost; Embankments; Subgrade	T.7470	3	0.8	90.883
Pavements; Weigh-In-Motion (WIM); Axles	T.33978	3	0.29	78.065
Tack; Interlayers; Geogrid	T.16096	2	0.84	87.723
Asphalt Mixtures; Rutting; Pavement	T.21505	2	1.27	86.198
Asphalt Mixtures; Rheometers; Asphalt	T.35997	2	0.12	72.926
Geological Disaster; Terrain Analysis; China	T.59908	2	0.92	27.478
Asphalt Mixtures; Rutting; Asphalt	T.87019	2	0	15.713
Asphaltenes; Petroleum; Oil	T.629	1	3.15	98.612
Digital Images; Speckle Patterns; Digital Image Correlation	T.3594	1	0.15	97.652
Portland Cement; Cement; Mortar	T.5366	1	0	96.981

主题	主题编号	论文产出数	FWCI (Field-Weighted Citation Impact)	显著度占比
Microwave Heating; Pasteurization; Drying	T.8951	1	0.29	89.189
Asphalt Pavements; Pavement; Tires	T.16247	1	0.3	88.251
Skid Resistance; Pavement; Asphalt Pavements	T.17403	1	1.64	91.77
Reinforced Concrete; Stiffening; Deflection	T.17933	1	0	79.255
Pavements; Subgrade; Weights And Measures	T.18516	1	0	83.645
Snow Melting Systems; Asphalt Pavements; Asphalt	T.20421	1	0.35	91.347
Asphalt; Rutting; Emulsion	T.26284	1	1.94	91.908
Pavements; Tires; Roads	T.30865	1	2.7	82.921
Rutting; Asphalt Pavements; Modulus	T.31535	1	0.48	60.628
Mine Tailings; Cement; Kaolin	T.36800	1	0	71.339
Cements; Compressive Strength; Asphalt Pavements	T.37715	1	0.15	70.355
Asphalt Pavements; Permeameters; Asphalt	T.45261	1	1.36	69.86
Seals; Skid Resistance; Asphalt	T.57782	1	0.81	61.493
Pavements; Asphalt Concrete; Rutting	T.72355	1	1.1	36.073

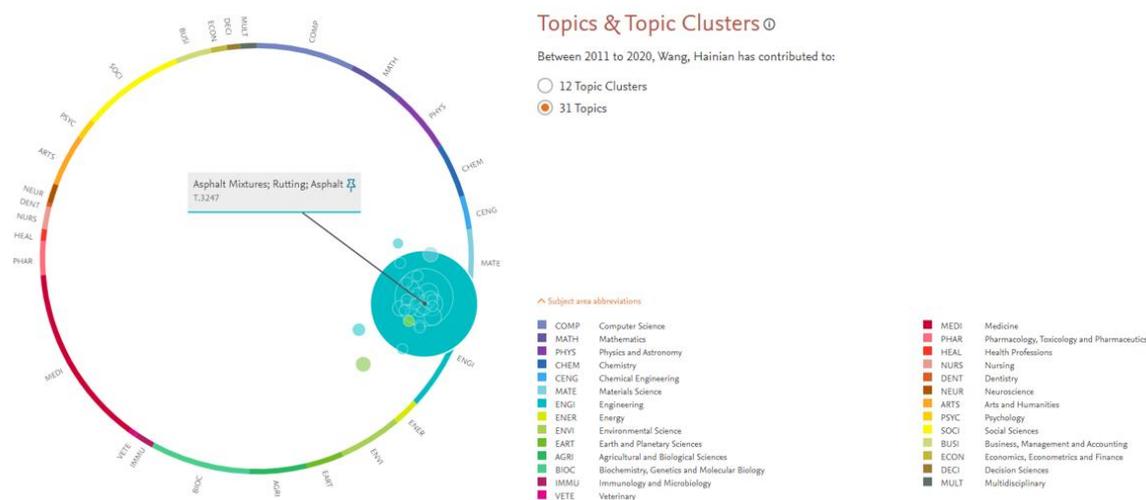


图 8 汪海年教授近十年（2011-2020）研究主题

### 3. 李培月

根据 scopus 数据库检索记录，汪海年教授目前共发表研究论文 116 篇，被 2391 篇论文共计引用 6560 次，h 指数为 48。

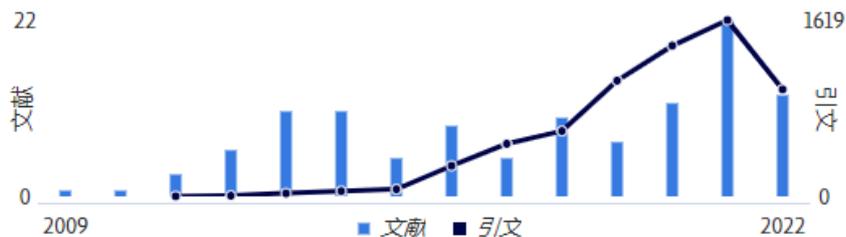


图 9 李培月教授发表文献与引用趋势图

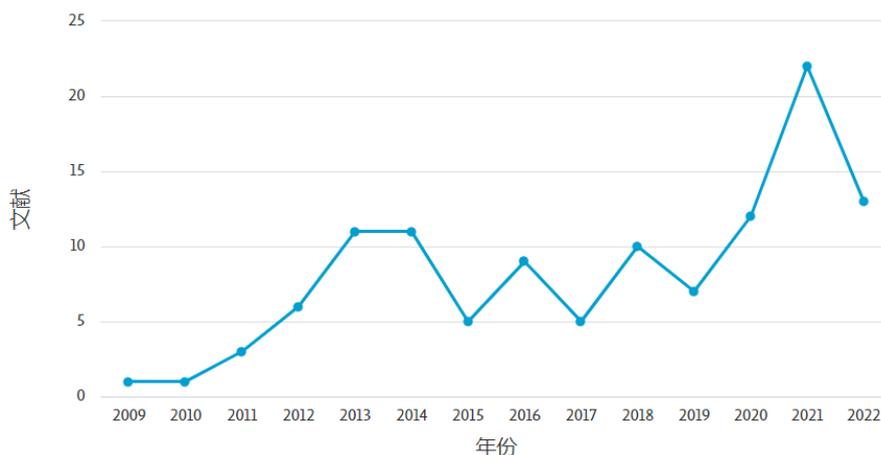


图 10 李培月教授发表文献年份分布图

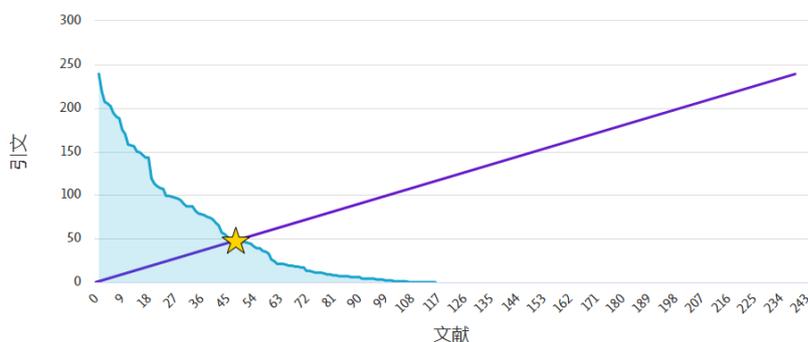


图 11 李培月教授 h 指数图

下表 3 和图 12 展示了近十年来李培月教授的主要研究主题以及在全球的显著度情况。

表 3 李培月教授近 10 年 (2011-2020) 研究主题概况

主题	主题编号	论文产出数	FWCI (Field-Weighted Citation Impact)	显著度占位
Groundwater Samples; Water Quality; Piper Pumping; Confined Aquifer; Aquitard	T.2475	44	7.48	99.444
Paddies; Puddling; Irrigation	T.8238	3	0.52	80.457
Sediment Contamination; Trace Metal; China	T.37412	3	1.26	42.601
Education; Document Markup Languages; Search Engines	T.1381	2	3.21	99.362
Monte Carlo Method; Power System; Outages	T.22471	2	1.98	81.411
Oil And Gas Fields; Oil Well Flooding; Waxes	T.83361	2	0.47	24.752
	T.84113	2	0.16	19.384

主题	主题编号	论文产出数	FWCI (Field-Weighted Citation Impact)	显著度占位
Prediction; Flood Forecasting; Water Tables	T.1472	1	0.88	99.658
Drinking Water; Groundwater Samples; Alluvial Aquifer	T.2903	1	2.56	98.379
Groundwater; Stream Channels; Groundwater-Surface Water Interaction	T.7564	1	3.26	95.412
Chance Constrained Programming; Water Resources; Water Allocation	T.8677	1	34.98	96.138
Adsorption; Calcium Carbonates; Dissolution	T.9494	1	0.34	91.034
Groundwater Contamination; Groundwater; Pollution Risk	T.11873	1	1.66	94.567
Materials Selection; Multicriteria Decision-making; Decision Making	T.18008	1	0.96	90.3
Coal Worker; Appalachian Region; Coal Mining	T.22903	1	9.76	75.207
Nitroso Compounds; Drinking Water; Groundwater	T.24942	1	8.82	84.06
Water; Exchangeable Sodium; Irrigation Water	T.34825	1	1.08	56.927
Estuaries; Sonneratia Apetala; Salinity	T.44762	1	12.81	27.586
Water Tables; China; Overdraft	T.46002	1	12.64	30.315
Groundwater Extraction; Recharge; Water Resources	T.50398	1	1.62	62.115
Polders; Flood Management; Rivers	T.51898	1	0.17	8.649
Ganesh; Total Dissolved Solids; Fuzzy Matrix	T.59736	1	27.92	46.067
China; Water Wells; Hydrochemistry	T.62174	1	0.09	45.47
Risk Assessment; Railroads; Resource Planning	T.79426	1	0.3	45.738
Hydroelectric Power Stations; Water Levels; Navigation	T.94939	1	0.34	0.922

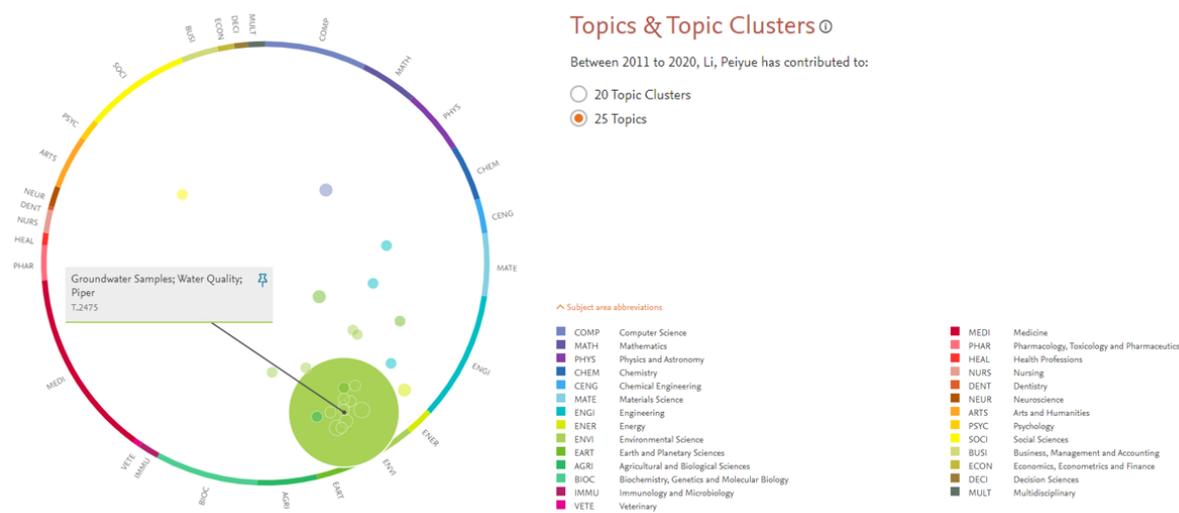


图 12 李培月教授近十年（2011-2020）研究主题

#### 4. 吴健华

根据 scopus 数据库检索记录，吴健华副教授目前共发表研究论文 76 篇，被 2138 篇论文共计引用 5639 次，h 指数为 44。

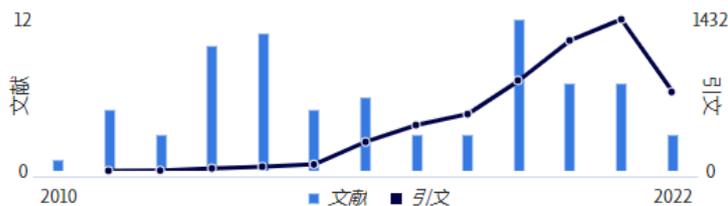


图 13 吴健华副教授发表文献与引用趋势图



图 14 吴健华副教授发表文献年份分布图

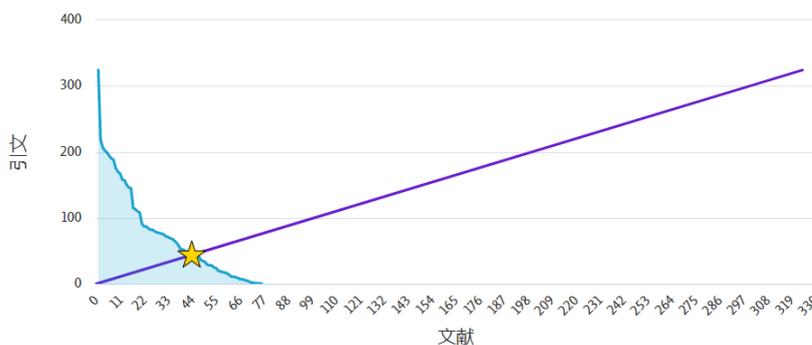


图 15 吴健华副教授 h 指数图

下表 4 和图 16 展示了近十年来吴健华副教授的主要研究主题以及在全球的显著度情况。

表 4 吴健华副教授近 10 年 (2011-2020) 研究主题概况

主题	主题编号	论文产出数	FWCI (Field-Weighted Citation Impact)	显著度占位
Groundwater Samples; Water Quality; Piper Paddies; Puddling; Irrigation	T.2475	40	7.23	99.444
Sediment Contamination; Trace Metal; China	T.37412	3	1.26	42.601
Pumping; Confined Aquifer; Aquitard	T.1381	2	3.21	99.362
Monte Carlo Method; Power System; Outages	T.8238	2	0.31	80.457
Prediction; Flood Forecasting; Water Tables	T.83361	2	0.47	24.752
Drinking Water; Groundwater Samples; Alluvial Aquifer	T.1472	1	0.88	99.658
Groundwater; Stream Channels; Groundwater-Surface Water Interaction	T.2903	1	2.56	98.379
	T.7564	1	3.26	95.412

主题	主题编号	论文 产出数	FWCI (Field-Weighted Citation Impact)	显著度占位
Materials Selection; Multicriteria Decision-making; Decision Making	T.18008	1	0.96	90.3
Heavy Metal; Total Dissolved Solids; Fecal Bacterium	T.18474	1	0.39	96.699
Education; Document Markup Languages; Search Engines	T.22471	1	2.63	81.411
Coal Worker; Appalachian Region; Coal Mining	T.22903	1	9.76	75.207
Water; Exchangeable Sodium; Irrigation Water	T.34825	1	1.08	56.927
Water Tables; China; Overdraft	T.46002	1	12.64	30.315
Groundwater Extraction; Recharge; Water Resources	T.50398	1	1.62	62.115
Polders; Flood Management; Rivers	T.51898	1	0.17	8.649
Groundwater Samples; Cadmium; Metals	T.52122	1	0	46.951
China; Water Wells; Hydrochemistry	T.62174	1	0.09	45.47
Risk Assessment; Railroads; Resource Planning	T.79426	1	0.3	45.738
Fuzzy Control; Content-Based Image Retrieval; X-Ray Detector	T.83547	1	0	28.331

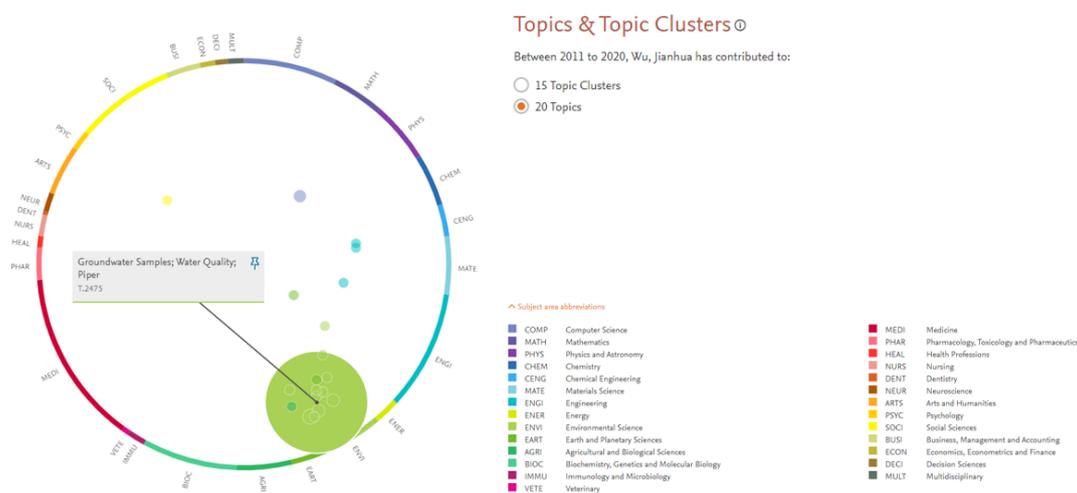


图 16 吴健华副教授近十年（2011-2020）研究主题

## 二. Nature Latest Research Articles

### 1. Nature Chemistry

(1) 标题: A two-directional vibrational probe reveals different electric field orientations in solution and an enzyme active site

作者: Chu Zheng, Yuezhi Mao, Jacek Kozuch .etc

摘要: The catalytic power of an electric field depends on its magnitude and orientation with respect to the reactive chemical species. Understanding and designing new catalysts for electrostatic catalysis thus requires methods to measure the electric field orientation and magnitude at the molecular scale. We demonstrate that electric field orientations can be extracted using a two-directional vibrational probe by exploiting the vibrational Stark effect of both the C=O and C–D stretches of a deuterated aldehyde. Combining spectroscopy with molecular dynamics and electronic structure partitioning methods, we demonstrate that, despite distinct polarities, solvents act similarly in their preference for electrostatically stabilizing large bond dipoles at the expense of destabilizing small ones. In contrast, we find that for an active-site aldehyde inhibitor of liver alcohol dehydrogenase, the electric field orientation deviates markedly from that found in solvents, which provides direct evidence for the fundamental difference between the electrostatic environment of solvents and that of a preorganized enzyme active site.

链接: <https://www.nature.com/articles/s41557-022-00937-w>

(2) 标题: Collisional excitation of HNC by He found to be stronger than for structural isomer HCN in experiments at the low temperatures of interstellar space

作者: Brian M. Hays, Divita Gupta, Théo Guillaume .etc

摘要: HCN and its unstable isomer HNC are widely observed throughout the interstellar medium, with the HNC/HCN abundance ratio correlating strongly with temperature. In very cold environments HNC can even appear more abundant than HCN. Here we use a chirped pulse Fourier transform spectrometer to measure the pressure broadening of HCN and HNC, simultaneously formed in situ by laser photolysis and cooled to low temperatures in uniform supersonic flows of helium. Despite the apparent similarity of these systems, we find the HNC–He cross section to be more than twice as big as the HCN–He cross section at 10 K, confirming earlier quantum calculations. Our experimental results are supported by high-level scattering calculations and are also expected to apply with para-H<sub>2</sub>, demonstrating that HCN

and HNC have different collisional excitation properties that strongly influence the derived interstellar abundances.

**链接:** <https://www.nature.com/articles/s41557-022-00936-x>

**(3)标题:** Anisotropic dynamics of resonant scattering between a pair of cold aligned diatoms

**作者:** Haowen Zhou, William E. Perreault, Nandini Mukherjee.etc

**摘要:** The collision dynamics between a pair of aligned molecules in the presence of a partial-wave resonance provide the most sensitive probe of the long-range anisotropic forces important to chemical reactions. Here we control the collision temperature and geometry to probe the dynamics of cold (1–3 K) rotationally inelastic scattering of a pair of optically state-prepared D<sub>2</sub> molecules. The collision temperature is manipulated by combining the gating action of laser state preparation and detection with the velocity dispersion of the molecular beam. When the bond axes of both molecules are aligned parallel to the collision velocity, the scattering rate drops by a factor of 3.5 as collision energies  $>2.1$  K are removed, suggesting a geometry-dependent resonance. Partial-wave analysis of the measured angular distribution supports a shape resonance within the centrifugal barrier of the  $l=2$  incoming orbital. Our experiment illustrates the strong anisotropy of the quadrupole–quadrupole interaction that controls the dynamics of resonant scattering.

**链接:** <https://www.nature.com/articles/s41557-022-00926-z>

**(4)标题:** Condensates in RNA repeat sequences are heterogeneously organized and exhibit reptation dynamics

**作者:** Hung T. Nguyen, Naoto Hori & D. Thirumalai

**摘要:** Although it is known that RNA undergoes liquid–liquid phase separation, the interplay between the molecular driving forces and the emergent features of the condensates, such as their morphologies and dynamic properties, is not well understood. We introduce a coarse-grained model to simulate phase separation of trinucleotide repeat RNAs, which are implicated in neurological disorders. After establishing that the simulations reproduce key experimental findings, we show that once recruited inside the liquid droplets, the monomers transition from hairpin-like structures to extended states. Interactions between the monomers in the condensates result in the formation of an intricate and dense intermolecular network, which severely restrains the fluctuations and mobilities of the RNAs inside large droplets. In the largest densely packed high-viscosity droplets, the mobility of RNA chains is best characterized by reptation, reminiscent of the dynamics in polymer melts. Our work

provides a microscopic framework for understanding liquid–liquid phase separation in RNA, which is not easily discernible in current experiments.

**链接:** <https://www.nature.com/articles/s41557-022-00934-z>

**(5) 标题:** Global analysis of biosynthetic gene clusters reveals conserved and unique natural products in entomopathogenic nematode-symbiotic bacteria

**作者:** Yi-Ming Shi, Merle Hirschmann, Yan-Ni Shi .etc

**摘要:** Microorganisms contribute to the biology and physiology of eukaryotic hosts and affect other organisms through natural products. *Xenorhabdus* and *Photorhabdus* (XP) living in mutualistic symbiosis with entomopathogenic nematodes generate natural products to mediate bacteria–nematode–insect interactions. However, a lack of systematic analysis of the XP biosynthetic gene clusters (BGCs) has limited the understanding of how natural products affect interactions between the organisms. Here we combine pangenome and sequence similarity networks to analyse BGCs from 45 XP strains that cover all sequenced strains in our collection and represent almost all XP taxonomy. The identified 1,000 BGCs belong to 176 families. The most conserved families are denoted by 11 BGC classes. We homologously (over)express the ubiquitous and unique BGCs and identify compounds featuring unusual architectures. The bioactivity evaluation demonstrates that the prevalent compounds are eukaryotic proteasome inhibitors, virulence factors against insects, metallophores and insect immunosuppressants. These findings explain the functional basis of bacterial natural products in this tripartite relationship.

**链接:** <https://www.nature.com/articles/s41557-022-00923-2>

**(6) 标题:** Fabrication of devices featuring covalently linked MoS<sub>2</sub>–graphene heterostructures

**作者:** Manuel Vázquez Sulleiro, Aysegul Develioglu, Ramiro Quirós-Ovies .etc

**摘要:** The most widespread method for the synthesis of 2D–2D heterostructures is the direct growth of one material on top of the other. Alternatively, flakes of different materials can be manually stacked on top of each other. Both methods typically involve stacking 2D layers through van der Waals forces—such that these materials are often referred to as van der Waals heterostructures—and are stacked one crystal or one device at a time. Here we describe the covalent grafting of 2H-MoS<sub>2</sub> flakes onto graphene monolayers embedded in field-effect transistors. A bifunctional molecule featuring a maleimide and a diazonium functional group was used, known to connect to sulfide- and carbon-based materials, respectively. MoS<sub>2</sub> flakes were exfoliated, functionalized by reaction with the maleimide moieties and then anchored to graphene

by the diazonium groups. This approach enabled the simultaneous functionalization of several devices. The electronic properties of the resulting heterostructure are shown to be dominated by the MoS<sub>2</sub>–graphene interface.

链接: <https://www.nature.com/articles/s41557-022-00924-1>

(7) 标题: Binding methane to a metal centre

作者: James. D. Watson, Leslie. D. Field & Graham. E. Ball

摘要: The  $\sigma$ -alkane complexes of transition metals, which contain an essentially intact alkane molecule weakly bound to the metal, have been well established as crucial intermediates in the activation of the strong C–H  $\sigma$ -bonds found in alkanes. Methane, the simplest alkane, binds even more weakly than larger alkanes. Here we report an example of a long-lived methane complex formed by directly binding methane as an incoming ligand to a reactive organometallic complex. Photo-ejection of carbon monoxide from a cationic osmium–carbonyl complex dissolved in an inert hydrofluorocarbon solvent saturated with methane at  $-90\text{ }^\circ\text{C}$  affords an osmium(II) complex,  $[\eta^5\text{-CpOs}(\text{CO})_2(\text{CH}_4)]^+$ , containing methane bound to the metal centre. Nuclear magnetic resonance (NMR) spectroscopy confirms the identity of the  $\sigma$ -methane complex and shows that the four protons of the metal-bound methane are in rapid exchange with each other. The methane ligand has a characteristically shielded  $^1\text{H}$  NMR resonance ( $\delta -2.16$ ), and the highly shielded carbon resonance ( $\delta -56.3$ ) shows coupling to the four attached protons ( $1\text{J}_{\text{C-H}} = 127\text{ Hz}$ ). The methane complex has an effective half-life of about 13 hours at  $-90\text{ }^\circ\text{C}$ .

链接: <https://www.nature.com/articles/s41557-022-00929-w>

(8) 标题: Accelerating symmetry-breaking charge separation in a perylenediimide trimer through a vibronically coherent dimer intermediate

作者: Chenjian Lin, Taeyeon Kim, Jonathan D. Schultz .etc

摘要: Understanding the photophysics and photochemistry of molecular  $\pi$ -stacked chromophores is important for utilizing them as functional photonic materials. However, these investigations have been mostly limited to covalent molecular dimers, which can only approximate the electronic and vibronic interactions present in the higher oligomers typical of functional organic materials. Here we show that a comparison of the excited-state dynamics of a covalent slip-stacked perylenediimide dimer (2) and trimer (3) provides fundamental insights into electronic state mixing and symmetry-breaking charge separation (SB-CS) beyond the dimer limit. We find that coherent vibronic coupling to high-frequency modes facilitates ultrafast state mixing between the Frenkel exciton (FE) and charge-transfer (CT) states.

Subsequently, solvent fluctuations and interchromophore low-frequency vibrations promote CT character in the coherent FE/CT mixed state. The coherent FE/CT mixed state persists in 2, but, in 3, low-frequency vibronic coupling collapses the coherence, resulting in ultrafast SB-CS between the distal perylenediimide units.

链接: <https://www.nature.com/articles/s41557-022-00927-y>

(9) 标题: Parallel transmission in a synthetic nerve

作者: Charlotte E. G. Hoskin, Vanessa Restrepo Schild, Javier Vinals .etc

摘要: Bioelectronic devices that are tetherless and soft are promising developments in medicine, robotics and chemical computing. Here, we describe bioinspired synthetic neurons, composed entirely of soft, flexible biomaterials, capable of rapid electrochemical signal transmission over centimetre distances. Like natural cells, our synthetic neurons release neurotransmitters from their terminals, which initiate downstream reactions. The components of the neurons are nanolitre aqueous droplets and hydrogel fibres, connected through lipid bilayers. Transmission is powered at these interfaces by light-driven proton pumps and mediated by ion-conducting protein pores. By bundling multiple neurons into a synthetic nerve, we have shown that distinct signals can propagate simultaneously along parallel axons, thereby transmitting spatiotemporal information. Synthetic nerves might play roles in next-generation implants, soft machines and computing devices.

链接: <https://www.nature.com/articles/s41557-022-00916-1>

(10) 标题: Tunable acetylene sorption by flexible catenated metal–organic frameworks

作者: Mickaele Bonneau, Christophe Lavenn, Jia-Jia Zheng .etc

摘要: The safe storage of flammable gases, such as acetylene, is essential for current industrial purposes. However, the narrow pressure (P) and temperature range required for the industrial use of pure acetylene ( $100 < P < 200$  kPa at 298 K) and its explosive behaviour at higher pressures make its storage and release challenging. Flexible metal–organic frameworks that exhibit a gated adsorption/desorption behaviour—in which guest uptake and release occur above threshold pressures, usually accompanied by framework deformations—have shown promise as storage adsorbents. Herein, the pressures for gas uptake and release of a series of zinc-based mixed-ligand catenated metal–organic frameworks were controlled by decorating its ligands with two different functional groups and changing their ratio. This affects the deformation energy of the framework, which in turn controls the gated behaviour. The materials offer good performances for acetylene storage with a usable capacity of  $\sim 90$  v/v (77%

of the overall amount) at 298 K and under a practical pressure range (100–150 kPa).

**链接:** <https://www.nature.com/articles/s41557-022-00928-x>

**(11) 标题:** In situ multiscale probing of the synthesis of a Ni-rich layered oxide cathode reveals reaction heterogeneity driven by competing kinetic pathways

**作者:** Hyeokjun Park, Hayoung Park, Kyung Song .etc

**摘要:** Nickel-rich layered oxides are envisaged as key near-future cathode materials for high-energy lithium-ion batteries. However, their practical application has been hindered by their inferior cycle stability, which originates from chemo-mechanical failures. Here we probe the solid-state synthesis of  $\text{LiNi}_0.6\text{Co}_0.2\text{Mn}_0.2\text{O}_2$  in real time to better understand the structural and/or morphological changes during phase evolution. Multi-length-scale observations—using aberration-corrected transmission electron microscopy, in situ heating transmission electron microscopy and in situ X-ray diffraction—reveal that the overall synthesis is governed by the kinetic competition between the intrinsic thermal decomposition of the precursor at the core and the topotactic lithiation near the interface, which results in spatially heterogeneous intermediates. The thermal decomposition leads to the formation of intergranular voids and intragranular nanopores that are detrimental to cycling stability. Furthermore, we demonstrate that promoting topotactic lithiation during synthesis can mitigate the generation of defective structures and effectively suppress the chemo-mechanical failures.

**链接:** <https://www.nature.com/articles/s41557-022-00915-2>

**(12) 标题:** Stabilization of hexazine rings in potassium polynitride at high pressure

**作者:** Yu Wang, Maxim Bykov, Ilya Chepkasov .etc

**摘要:** Polynitrogen molecules are attractive for high-energy-density materials due to energy stored in nitrogen–nitrogen bonds; however, it remains challenging to find energy-efficient synthetic routes and stabilization mechanisms for these compounds. Direct synthesis from molecular dinitrogen requires overcoming large activation barriers and the reaction products are prone to inherent inhomogeneity. Here we report the synthesis of planar  $\text{N}_6^{2-}$  hexazine dianions, stabilized in  $\text{K}_2\text{N}_6$ , from potassium azide ( $\text{KN}_3$ ) on laser heating in a diamond anvil cell at pressures above 45 GPa. The resulting  $\text{K}_2\text{N}_6$ , which exhibits a metallic lustre, remains metastable down to 20 GPa. Synchrotron X-ray diffraction and Raman spectroscopy were used to identify this material, through good agreement with the theoretically predicted structural, vibrational and electronic properties for  $\text{K}_2\text{N}_6$ . The  $\text{N}_6^{2-}$  rings characterized here are likely to be present in other high-energy-density materials

stabilized by pressure. Under 30 GPa, an unusual  $N_{20.75}$ -containing compound with the formula  $K_3(N_2)_4$  was formed instead.

链接: <https://www.nature.com/articles/s41557-022-00925-0>

(13) 标题: Photogearing as a concept for translation of precise motions at the nanoscale

作者: Aaron Gerwien, Frederik Gnannt, Peter Mayer .etc

摘要: One of the major challenges for harnessing the true potential of functional nano-machinery is integrating and transmitting motion with great precision. Molecular gearing systems enable the integration of multiple motions in a correlated fashion to translate motions from one locality to another and to change their speed and direction. However, currently no powerful methods exist to implement active driving of gearing motions at the molecular scale. Here we present a light-fuelled molecular gearing system and demonstrate its superiority over passive thermally activated gearing. Translation of a  $180^\circ$  rotation into a  $120^\circ$  rotation is achieved while at the same time the direction of the rotation axis is shifted by  $120^\circ$ . Within such photogearing processes, precise motions at the nanoscale can be changed in direction and decelerated in a manner similar to macroscopic bevel-gear operations in an energy consuming way—a necessary prerequisite to employ gearing as an active component in future mechanical nano-systems.

链接: <https://www.nature.com/articles/s41557-022-00917-0>

(14) 标题: Ion-pair reorganization regulates reactivity in photoredox catalysts

作者: J. D. Earley, A. Zieleniewska, H. H. Ripberger .etc

摘要: Cyclometalated and polypyridyl complexes of d6 metals are promising photoredox catalysts, using light to drive reactions with high kinetic or thermodynamic barriers via the generation of reactive radical intermediates. However, while tuning of their redox potentials, absorption energy, excited-state lifetime and quantum yield are well-known criteria for modifying activity, other factors could be important. Here we show that dynamic ion-pair reorganization controls the reactivity of a photoredox catalyst,  $[Ir(dF(CF_3)ppy)_2(dtbbpy)]X$ . Time-resolved dielectric-loss experiments show how counter-ion identity influences excited-state charge distribution, evincing large differences in both the ground- and excited-state dipole moment depending on whether X is a small associating anion ( $PF_6^-$ ) that forms a contact-ion pair versus a large one that either dissociates or forms a solvent-separated pair ( $BArF_4^-$ ). These differences correlate with the reactivity of the photocatalyst toward both reductive and oxidative electron transfer, amounting to a 4-fold change in

selectivity toward oxidation versus reduction. These results suggest that ion pairing could be an underappreciated factor that modulates reactivity in ionic photoredox catalysts.

**链接:** <https://www.nature.com/articles/s41557-022-00911-6>

**(15) 标题:** Halogen-bond-assisted radical activation of glycosyl donors enables mild and stereoconvergent 1,2-cis-glycosylation

**作者:** Chen Zhang, Hao Zuo, Ga Young Lee .etc

**摘要:** The chemistry of carbohydrates has a history of over 100 years, but simple, stereoselective and efficient glycosylation methods remain highly needed to facilitate the studies of sugars in various disciplines. Here we report a strategy for 1,2-cis-glycosylation without using metals, strong (Lewis) acids, elaborate catalysts or labile substrates. Our method operates by a unique mechanism: it activates glycosyl donors through a radical cascade rather than the conventional acid-promoted, ionic process. As elucidated by computational and experimental studies, the allyl glycosyl sulfones (as donors) form halogen bond complexes with perfluoroalkyl iodides, which—merely by visible light irradiation—fragment via radical intermediates to give the electrophilic glycosyl iodides. In situ trapping by various nucleophiles affords, in a stereoconvergent manner, the challenging 1,2-cis-glycosides. This metal- and acid-free reaction shows remarkable tolerance to functional groups. The high stereoselectivity holds for a broad array of donors. This study suggests that the simple C2-alkoxy group can serve as an effective directing group for building 1,2-cis-glycosidic bonds.

**链接:** <https://www.nature.com/articles/s41557-022-00918-z>

**(16) 标题:** Serial crystallography captures dynamic control of sequential electron and proton transfer events in a flavoenzyme

**作者:** Manuel Maestre-Reyna, Cheng-Han Yang .etc

**摘要:** Flavin coenzymes are universally found in biological redox reactions. DNA photolyases, with their flavin chromophore (FAD), utilize blue light for DNA repair and photoreduction. The latter process involves two single-electron transfers to FAD with an intermittent protonation step to prime the enzyme active for DNA repair. Here we use time-resolved serial femtosecond X-ray crystallography to describe how light-driven electron transfers trigger subsequent nanosecond-to-microsecond entanglement between FAD and its Asn/Arg-Asp redox sensor triad. We found that this key feature within the photolyase-cryptochrome family regulates FAD re-hybridization and protonation. After first electron transfer, the FAD<sup>•-</sup> isoalloxazine

ring twists strongly when the arginine closes in to stabilize the negative charge. Subsequent breakage of the arginine–aspartate salt bridge allows proton transfer from arginine to FAD•-. Our molecular videos demonstrate how the protein environment of redox cofactors organizes multiple electron/proton transfer events in an ordered fashion, which could be applicable to other redox systems such as photosynthesis.

**链接:** <https://www.nature.com/articles/s41557-022-00922-3>

**(17) 标题:** Stereocontrolled 1,3-nitrogen migration to access chiral  $\alpha$ -amino acids

**作者:** Chen-Xi Ye, Xiang Shen, Shuming Chen .etc

**摘要:**  $\alpha$ -Amino acids are essential for life as building blocks of proteins and components of diverse natural molecules. In both industry and academia, the incorporation of unnatural amino acids is often desirable for modulating chemical, physical and pharmaceutical properties. Here we report a protocol for the economical and practical synthesis of optically active  $\alpha$ -amino acids based on an unprecedented stereocontrolled 1,3-nitrogen shift. Our method employs abundant and easily accessible carboxylic acids as starting materials, which are first connected to a nitro group, followed by a highly regio- and enantioselective ruthenium- or iron-catalysed C(sp<sup>3</sup>)-H amination. This straightforward method displays a very broad scope, providing rapid access to optically active  $\alpha$ -amino acids with aryl, allyl, propargyl and alkyl side chains, and also permits stereocontrolled late-stage amination of carboxylic-acid-containing drugs and natural products.

**链接:** <https://www.nature.com/articles/s41557-022-00895-3>

**(18) 标题:** Single-particle combinatorial multiplexed liposome fusion mediated by DNA

**作者:** Mette Galsgaard Malle, Philipp M. G. Löffler, Søren S.-R. Bohr .etc

**摘要:** Combinatorial high-throughput methodologies are central for both screening and discovery in synthetic biochemistry and biomedical sciences. They are, however, often reliant on large-scale analyses and thus limited by a long running time and excessive materials cost. We here present a single-particle combinatorial multiplexed liposome fusion mediated by DNA for parallelized multistep and non-deterministic fusion of individual subattolitre nanocontainers. We observed directly the efficient (>93%) and leakage free stochastic fusion sequences for arrays of surface-tethered target liposomes with six freely diffusing populations of cargo liposomes, each functionalized with individual lipidated single-stranded DNA and fluorescently barcoded by a distinct ratio of chromophores. The stochastic fusion resulted in a distinct permutation of fusion sequences for each autonomous nanocontainer.

Real-time total internal reflection imaging allowed the direct observation of >16,000 fusions and 566 distinct fusion sequences accurately classified using machine learning. The high-density arrays of surface-tethered target nanocontainers (~42,000 containers per mm<sup>2</sup>) offers entire combinatorial multiplex screens using only picograms of material.

**链接:** <https://www.nature.com/articles/s41557-022-00912-5>

**(19) 标题:** Direct conversion of white phosphorus to versatile phosphorus transfer reagents via oxidative onioation

**作者:** Maximilian Donath, Kai Schwedtmann, Tobias Schneider .etc

**摘要:** The main feedstock for the value-added phosphorus chemicals used in industry and research is white phosphorus (P<sub>4</sub>), from which the key intermediate for forming P(III) compounds is PCl<sub>3</sub>. Owing to its high reactivity, syntheses based on PCl<sub>3</sub> are often accompanied by product mixtures and laborious work-up procedures, so an alternative process to form a viable P(III) transfer reagent is desirable. Our concept of oxidative onioation, where white phosphorus is selectively converted into triflate salts of versatile P<sup>I</sup> transfer reagents such as [P(LN)<sub>3</sub>][OTf]<sub>3</sub> (LN is a cationic, N-based substituent; that is, 4-dimethylaminopyridinio), provides a convenient alternative for the implementation of P–O, P–N and P–C bonds while circumventing the use of PCl<sub>3</sub>. We use p-block element compounds of type R<sub>n</sub>E (for example, Ph<sub>3</sub>As or PhI) to access weak adducts between nitrogen Lewis bases LN and the corresponding dications [R<sub>n</sub>ELN]<sub>2</sub><sup>+</sup>. The proposed equilibrium between [R<sub>n</sub>ELN]<sub>2</sub><sup>+</sup> + LN and [R<sub>n</sub>E(LN)<sub>2</sub>]<sub>2</sub><sup>+</sup> allows for the complete oxidative onioation of all six P–P bonds in P<sub>4</sub> to yield highly reactive and versatile trications [P(LN)<sub>3</sub>]<sub>3</sub><sup>+</sup>.

**链接:** <https://www.nature.com/articles/s41557-022-00913-4>

## 2. Nature Climate Change

**(1) 标题:** Trophic level decoupling drives future changes in phytoplankton bloom phenology

**作者:** Ryohei Yamaguchi, Keith B. Rodgers, Axel Timmermann .etc

**摘要:** Climate change can drive shifts in the seasonality of marine productivity, with consequences for the marine food web. However, these alterations in phytoplankton bloom phenology (initiation and peak timing), and the underlying drivers, are not well understood. Here, using a 30-member Large Ensemble of climate change projections, we show earlier bloom initiation in most ocean regions, yet changes in bloom peak timing vary widely by region. Shifts in both initiation and peak timing are induced by

a subtle decoupling between altered phytoplankton growth and zooplankton predation, with increased zooplankton predation (top-down control) playing an important role in altered bloom peak timing over much of the global ocean. Only in limited regions is light limitation a primary control for bloom initiation changes. In the extratropics, climate-change-induced phenological shifts will exceed background natural variability by the end of the twenty-first century, which may impact energy flow in the marine food webs.

**链接:** <https://www.nature.com/articles/s41558-022-01353-1>

**(2) 标题:** Observed influence of anthropogenic climate change on tropical cyclone heavy rainfall

**作者:** Nobuyuki Utsumi & Hyungjun Kim

**摘要:** The impact of climate change on tropical cyclones (TCs) is of great concern in the Western North Pacific (WNP) region. Observations suggest that there have been recent changes in TC-related heavy rainfall. However, it has not yet been determined whether anthropogenic forcing has any contribution to such changes. Here, we show evidence that the human-induced warming has considerably changed the frequency of TC-induced heavy rainfall events in the WNP region. Observations since 1961 show that the occurrence of TC-induced heavy rainfall has significantly increased along coastal East Asia, while it has decreased in the southern part of WNP. On the basis of large ensemble climate simulations, we demonstrate that the observed changes cannot be explained solely by natural variability. This suggests that anthropogenic impacts have already significantly altered the TC-induced heavy rainfall pattern in the WNP region.

**链接:** <https://www.nature.com/articles/s41558-022-01344-2>

**(3) 标题:** Empirical evidence for recent global shifts in vegetation resilience

**作者:** Taylor Smith, Dominik Traxl & Niklas Boers

**摘要:** The character and health of ecosystems worldwide is tightly coupled to changes in Earth's climate. Theory suggests that ecosystem resilience—the ability of ecosystems to resist and recover from external shocks such as droughts and fires—can be inferred from their natural variability. Here, we quantify vegetation resilience globally with complementary metrics based on two independent long-term satellite records. We first empirically confirm that the recovery rates from large perturbations can be closely approximated from internal vegetation variability across vegetation types and climate zones. On the basis of this empirical relationship, we quantify vegetation resilience continuously and globally from 1992 to 2017. Long-term

vegetation resilience trends are spatially heterogeneous, with overall increasing resilience in the tropics and decreasing resilience at higher latitudes. Shorter-term trends, however, reveal a marked shift towards a global decline in vegetation resilience since the early 2000s, particularly in the equatorial rainforest belt.

**链接:** <https://www.nature.com/articles/s41558-022-01352-2>

**(4) 标题:** Natural variability has dominated Atlantic Meridional Overturning Circulation since 1900

**作者:** Mojib Latif, Jing Sun, Martin Visbeck .etc

**摘要:** There is debate about slowing of the Atlantic Meridional Overturning Circulation (AMOC), a key component of the global climate system. Some focus is on the sea surface temperature (SST) slightly cooling in parts of the subpolar North Atlantic despite widespread ocean warming. Atlantic SST is influenced by the AMOC, especially on decadal timescales and beyond. The local cooling could thus reflect AMOC slowing and diminishing heat transport, consistent with climate model responses to rising atmospheric greenhouse gas concentrations. Here we show from Atlantic SST the prevalence of natural AMOC variability since 1900. This is consistent with historical climate model simulations for 1900–2014 predicting on average AMOC slowing of about 1 Sv at 30° N after 1980, which is within the range of internal multidecadal variability derived from the models' preindustrial control runs. These results highlight the importance of systematic and sustained in-situ monitoring systems that can detect and attribute with high confidence an anthropogenic AMOC signal.

**链接:** <https://www.nature.com/articles/s41558-022-01342-4>

**(5) 标题:** Constraining the increased frequency of global precipitation extremes under warming

**作者:** Chad W. Thackeray, Alex Hall, Jesse Norris .etc

**摘要:** A key indicator of climate change is the greater frequency and intensity of precipitation extremes across much of the globe. In fact, several studies have already documented increased regional precipitation extremes over recent decades. Future projections of these changes, however, vary widely across climate models. Using two generations of models, here we demonstrate an emergent relationship between the future increased occurrence of precipitation extremes aggregated over the globe and the observable change in their frequency over recent decades. This relationship is robust in constraining frequency changes in precipitation extremes in two separate ensembles and under two future emissions pathways (reducing intermodel spread by

20–40%). Moreover, this relationship is also apparent when the analysis is limited to near-global land regions. These constraints suggest that historical global precipitation extremes will occur roughly  $32 \pm 8\%$  more often than at present by 2100 under a medium-emissions pathway (and  $55 \pm 13\%$  more often under high emissions).

**链接:** <https://www.nature.com/articles/s41558-022-01329-1>

**(6) 标题:** Antarctic sea-ice expansion and Southern Ocean cooling linked to tropical variability

**作者:** Eui-Seok Chung, Seong-Joong Kim, Axel Timmermann .etc

**摘要:** A variety of hypotheses, involving sub-ice-shelf melting, stratospheric ozone depletion and tropical teleconnections, have been proposed to explain the observed Antarctic sea-ice expansion over the period of continuous satellite monitoring and corresponding model–observation discrepancy, but the issue remains unresolved. Here, by comparing multiple large ensembles of model simulations with available observations, we show that Antarctic sea ice has expanded due to ocean surface cooling associated with multidecadal variability in the Southern Ocean that temporarily outweighs the opposing forced response. In both observations and model simulations, Southern Ocean multidecadal variability is closely linked to internal variability in the tropics, especially in the Pacific, via atmospheric teleconnections. The linkages are, however, distinctly weaker in simulations than in observations, accompanied by a marked model–observation mismatch in global warming resulting from potential model bias in the forced response and observed tropical variability. Thus, the forced response dominates in simulations, resulting in apparent model–observation discrepancy.

**链接:** <https://www.nature.com/articles/s41558-022-01339-z>

**(7) 标题:** The critical benefits of snowpack insulation and snowmelt for winter wheat productivity

**作者:** Peng Zhu, Taegon Kim, Zhenong Jin .etc

**摘要:** How climate change will affect overwintering crops is largely unknown due to the complex and understudied interactions among temperature, rainfall and snowpack. Increases in average winter temperature should release cold limitations yet warming-induced reductions of snowpack thickness should lead to decreased insulation effects and more exposure to freezing. Here, using statistical models, we show that the presence of snowpack weakens yield sensitivity to freezing stress by 22% during 1999–2019. By 2080–2100, we project that reduced snow cover insulation will offset up to one-third of the yield benefit ( $8.8 \pm 1.1\%$  for RCP 4.5 and

11.8 ± 1.4% for RCP 8.5) from reduced frost stress across the United States. Furthermore, by 2080–2100 future decline in wheat growing season snowfall (source of snowmelt) will drive a yield loss greater than the yield benefit from increasing rainfall. Explicitly considering these factors is critical to predict the climate change impacts on winter wheat production in snowy regions.

**链接:** <https://www.nature.com/articles/s41558-022-01327-3>

**(8) 标题:** Freshwater forcing of the Atlantic Meridional Overturning Circulation revisited

**作者:** Feng He & Peter U. Clark

**摘要:** Freshwater (FW) forcing is widely identified as the dominant mechanism causing reductions of the Atlantic Meridional Overturning Circulation (AMOC), a climate tipping point that led to past abrupt millennial-scale climate changes. However, the AMOC response to FW forcing has not been rigorously assessed due to the lack of long-term AMOC observations and uncertainties of sea-level rise and ice-sheet melt needed to infer past FW forcing. Here we show a muted AMOC response to FW forcing (~50 m sea-level rise from the final deglaciation of Northern Hemisphere ice sheets) in the early-to-middle Holocene ~11,700–6,000 years ago. Including this muted AMOC response in a transient simulation of the Holocene with an ocean–atmosphere climate model improves the agreement between simulated and proxy temperatures of the past 21,000 years. This demonstrates that the AMOC may not be as sensitive to FW fluxes and Arctic freshening as is currently projected for the end of the twenty-first century.

**链接:** <https://www.nature.com/articles/s41558-022-01328-2>

**(9) 标题:** Restructuring of plankton genomic biogeography in the surface ocean under climate change

**作者:** Paul Fr émont, Marion Gehlen, Mathieu Vrac .etc

**摘要:** The impact of climate change on diversity, functioning and biogeography of marine plankton remains a major unresolved issue. Here environmental niches are evidenced for plankton communities at the genomic scale for six size fractions from viruses to meso-zooplankton. The spatial extrapolation of these niches portrays ocean partitionings south of 60° N into climato-genomic provinces characterized by signature genomes. By 2090, under the RCP8.5 future climate scenario, provinces are reorganized over half of the ocean area considered, and almost all provinces are displaced poleward. Particularly, tropical provinces expand at the expense of temperate ones. Sea surface temperature is identified as the main driver of changes

(50%), followed by phosphate (11%) and salinity (10%). Compositional shifts among key planktonic groups suggest impacts on the nitrogen and carbon cycles. Provinces are linked to estimates of carbon export fluxes which are projected to decrease, on average, by 4% in response to biogeographical restructuring.

**链接:** <https://www.nature.com/articles/s41558-022-01314-8>

**(10) 标题:** Towards climate-smart, three-dimensional protected areas for biodiversity conservation in the high seas

**作者:** Isaac Brito-Morales, David S. Schoeman, Jason D. Everett, .etc

**摘要:** Marine species are moving rapidly in response to warming, often in different directions and with variations dependent on location and depth. Given the current impetus to increase the area of protected ocean to 30%, conservation planning must include the 64% of the ocean beyond national jurisdictions, which in turn requires associated design challenges for conventional conservation to be addressed. Here we present a planning approach for the high seas that conserves biodiversity, minimizes exposure to climate change, retains species within reserve boundaries and reduces conflict with fishing. This is developed using data from across four depth domains, considering 12,932 vertebrate, invertebrate and algal species and three climate scenarios. The resultant climate-smart conservation areas cover 6% of the high seas and represent a low-regret option that provides a nucleus for developing a full network of high-seas marine reserves.

**链接:** <https://www.nature.com/articles/s41558-022-01323-7>

### 3. Nature Geoscience

**(1) 标题:** Shifts in regional water availability due to global tree restoration

**作者:** Anne J. Hoek van Dijke, Martin Herold .etc

**摘要:** Tree restoration is an effective way to store atmospheric carbon and mitigate climate change. However, large-scale tree-cover expansion has long been known to increase evaporation, leading to reduced local water availability and streamflow. More recent studies suggest that increased precipitation, through enhanced atmospheric moisture recycling, can offset this effect. Here we calculate how 900 million hectares of global tree restoration would impact evaporation and precipitation using an ensemble of data-driven Budyko models and the UTrack moisture recycling dataset. We show that the combined effects of directly enhanced evaporation and indirectly enhanced precipitation create complex patterns of shifting water availability. Large-scale tree-cover expansion can increase water availability by up to 6% in some regions, while decreasing it by up to 38% in others. There is a divergent impact on

large river basins: some rivers could lose 6% of their streamflow due to enhanced evaporation, while for other rivers, the greater evaporation is counterbalanced by more moisture recycling. Several so-called hot spots for forest restoration could lose water, including regions that are already facing water scarcity today. Tree restoration significantly shifts terrestrial water fluxes, and we emphasize that future tree-restoration strategies should consider these hydrological effects.

链接: <https://www.nature.com/articles/s41561-022-00935-0>

(2) 标题: Increasing atmospheric helium due to fossil fuel exploitation

作者: Benjamin Birner, Jeffrey Severinghaus, Bill Paplawsky .etc

摘要: Fossil fuels contain small amounts of helium, which are co-released into the atmosphere together with carbon dioxide. However, a clear build-up of helium in the atmosphere has not previously been detected. Using a high-precision mass spectrometry technique to determine the atmospheric ratio of helium-4 to nitrogen, we show that helium-4 concentrations have increased significantly over the past five decades. Obtaining a direct measure of the rise in atmospheric helium-4 is possible because changes in nitrogen are negligible. Using 46 air samples acquired between 1974 and 2020, we find that the helium-4 concentration increased at an average rate of  $39 \pm 3$  billion mol per year ( $2\sigma$ ). Given that previous observations have shown that the ratio between helium-3 and helium-4 in the atmosphere has remained constant, our results also imply that the concentration of helium-3 is increasing. The inferred rise in atmospheric helium-3 greatly exceeds estimates of anthropogenic emissions from natural gas, nuclear weapons and nuclear power generation, suggesting potential problems with previous isotope measurements or an incorrect assessment of known sources.

链接: <https://www.nature.com/articles/s41561-022-00932-3>

(3) 标题: Pulses in silicic arc magmatism initiate end-Permian climate instability and extinction

作者: Timothy Chapman, Luke A. Milan, Ian Metcalfe .etc

摘要: Brief pulses of intense volcanic eruptions along convergent margins emit substantial volatiles that drive climatic excursions that can lead to major extinction events. However, correlating volcanic outpouring to environmental crises in the geological past is often difficult due to poor preservation of volcanic sequences and the need for precise dating methods. Here we present a high-fidelity CA-TIMS U–Pb zircon record of an end-Permian flare-up event in eastern Australia, which involved the eruption of  $>39,000\text{--}150,000$  km<sup>3</sup> of silicic magma in circa  $4.21 \pm 0.5$  million

years. A correlated high-resolution tephra record (circa 260–249 Ma) in the proximal sedimentary basins suggests recurrence of eruptions from the volcanic field in intervals of ~51,000–145,000 years. Peak eruption activity at  $253 \pm 0.5$  million years ago is chronologically associated with intervals of pronounced species decline and the demise of the Glossopteris forests in the initial stages of the end-Permian mass extinction event (~1–2 Myr). Simultaneous eruptions along multiple arcs around the globe occurred at the same time as eastern Australia. In conjunction, these global eruptions are considered as a trigger of greenhouse crises and ecosystem stress that preceded the catastrophic eruption of the Siberian Traps.

**链接:** <https://www.nature.com/articles/s41561-022-00934-1>

**(4) 标题:** Intrusions induce global warming before continental flood basalt volcanism

**作者:** Xiaochuan Tian & W. Roger Buck

**摘要:** Extinction events are known to correlate with continental flood basalt eruptions. Massive carbon degassing from these eruptions can have catastrophic impacts on the global climate and biospheres. However, high-precision geochronology from the Deccan Traps and the Columbia River Basalt Group suggests that the onset of global warming precedes the main phase of flood basalt eruptions by several hundred thousand years. Here we construct a numerical model of sill intrusion to investigate this lag between warming and eruptions. The model determines the depth of sill intrusion depending on the evolving crustal density and temperature structures. Main-phase eruptions occur when the average density above the sill intrusion is greater than the magma density. When combined with a carbon-cycle simulation, the models can reproduce the observed timing and amplitude of the global warming events associated with the Deccan Traps and the Columbia River Basalt Group. We therefore conclude that major eruptions of continental flood basalts require densification of the crust by voluminous basaltic magma intrusions. The crystallization of such pre-eruption intrusions could release enough carbon dioxide to drive substantial global warming before the main phase of flood basalt volcanism.

**链接:** <https://www.nature.com/articles/s41561-022-00939-w>

**(5) 标题:** Antarctic ice-shelf advance driven by anomalous atmospheric and sea-ice circulation

**作者:** Frazer D. W. Christie, Toby J. Benham, Christine L. Batchelor .etc

**摘要:** The disintegration of the eastern Antarctic Peninsula's Larsen A and B ice shelves has been attributed to atmosphere and ocean warming, and increased mass

losses from the glaciers once restrained by these ice shelves have increased Antarctica's total contribution to sea-level rise. Abrupt recessions in ice-shelf frontal position presaged the break-up of Larsen A and B, yet, in the ~20 years since these events, documented knowledge of frontal change along the entire ~1,400-km-long eastern Antarctic Peninsula is limited. Here, we show that 85% of the seaward ice-shelf perimeter fringing this coastline underwent uninterrupted advance between the early 2000s and 2019, in contrast to the two previous decades. We attribute this advance to enhanced ocean-wave dampening, ice-shelf buttressing and the absence of sea-surface slope-induced gravitational ice-shelf flow. These phenomena were, in turn, enabled by increased near-shore sea ice driven by a Weddell Sea-wide intensification of cyclonic surface winds around 2002. Collectively, our observations demonstrate that sea-ice change can either safeguard from, or set in motion, the final rifting and calving of even large Antarctic ice shelves.

**链接:** <https://www.nature.com/articles/s41561-022-00938-x>

**(6) 标题:** Cyclical geothermal unrest as a precursor to Iceland's 2021 Fagradalsfjall eruption

**作者:** Ólafur G. Flóvenz, Rongjiang Wang, Gylfi Páll Hersir, .etc

**摘要:** Understanding and constraining the source of geodetic deformation in volcanic areas is an important component of hazard assessment. Here, we analyse deformation and seismicity for one year before the March 2021 Fagradalsfjall eruption in Iceland. We generate a high-resolution catalogue of 39,500 earthquakes using optical cable recordings and develop a poroelastic model to describe three pre-eruptional uplift and subsidence cycles at the Svartsengi geothermal field, 8 km west of the eruption site. We find the observed deformation is best explained by cyclic intrusions into a permeable aquifer by a fluid injected at 4 km depth below the geothermal field, with a total volume of  $0.11 \pm 0.05 \text{ km}^3$  and a density of  $850 \pm 350 \text{ kg m}^{-3}$ . We therefore suggest that ingression of magmatic  $\text{CO}_2$  can explain the geodetic, gravity and seismic data, although some contribution of magma cannot be excluded.

**链接:** <https://www.nature.com/articles/s41561-022-00930-5>

**(7) 标题:** Contrasting effects of aridity and seasonality on global salinization

**作者:** Saverio Perri, Annalisa Molini, Lars O. Hedin .etc

**摘要:** Soil salinization is the most diffuse form of soil degradation in drylands, where it represents a rising threat to crop production and ecosystem functioning. While aridity is thought to be the main driver of salt accumulation, the role played by other forms of climatic forcing, such as rainfall seasonality and synchronicity between

precipitation and atmospheric water demand, remains uncertain. Here, we use a combination of global climatic data, soil observations and ecohydrological models to show that average precipitation and seasonality have contrasting impacts on soil salinization. Aridity enhances salinization by lowering soil moisture and suppressing leaching events. By contrast, rainfall seasonality can reduce salt accumulation in the soil by boosting percolation during the wet season, when salt removal efficiency is greatest. Consequently, salt removal is more effective in regions where seasonality is coupled with strong asynchronicity between water supply and demand, such as in Mediterranean climates. As a result, neglecting the interplay of aridity, seasonality and asynchronicity may lead to inaccurate assessments of the impacts of climate on global soil salinization.

**链接:** <https://www.nature.com/articles/s41561-022-00931-4>

**(8) 标题:** Substantial carbon drawdown potential from enhanced rock weathering in the United Kingdom

**作者:** Euripides P. Kantzas, Maria Val Martin, Mark R. Lomas .etc

**摘要:** Achieving national targets for net-zero carbon emissions will require atmospheric carbon dioxide removal strategies compatible with rising agricultural production. One possible method for delivering on these goals is enhanced rock weathering, which involves modifying soils with crushed silicate rocks, such as basalt. Here we use dynamic carbon budget modelling to assess the carbon dioxide removal potential and agricultural benefits of implementing enhanced rock weathering strategies across UK arable croplands. We find that enhanced rock weathering could deliver net carbon dioxide removal of 6–30 MtCO<sub>2</sub> yr<sup>-1</sup> for the United Kingdom by 2050, representing up to 45% of the atmospheric carbon removal required nationally to meet net-zero emissions. This suggests that enhanced rock weathering could play a crucial role in national climate mitigation strategies if it were to gain acceptance across national political, local community and farm scales. We show that it is feasible to eliminate the energy-demanding requirement for milling rocks to fine particle sizes. Co-benefits of enhanced rock weathering include substantial mitigation of nitrous oxide, the third most important greenhouse gas, widespread reversal of soil acidification and considerable cost savings from reduced fertilizer usage. Our analyses provide a guide for other nations to pursue their carbon dioxide removal ambitions and decarbonize agriculture—a key source of greenhouse gases.

**链接:** <https://www.nature.com/articles/s41561-022-00925-2>

**(9) 标题:** A century of groundwater accumulation in Pakistan and northwest India

**作者:** D. J. MacAllister, G. Krishan, M. Basharat .etc

**摘要:** The groundwater systems of northwest India and central Pakistan are among the most heavily exploited in the world. However, recent, and well-documented, groundwater depletion has not been historically contextualized. Here, using a long-term observation-well dataset, we present a regional analysis of post-monsoon groundwater levels from 1900 to 2010. We show that human activity in the early twentieth century increased groundwater availability before large-scale exploitation began in the late twentieth century. Net groundwater accumulation in the twentieth century, calculated in areas with sufficient data, was at least 420 km<sup>3</sup> at ~3.6 cm yr<sup>-1</sup>. The development of the region's vast irrigation canal network, which increased groundwater recharge, played a defining role in twentieth-century groundwater accumulation. Between 1970 and 2000, groundwater levels stabilized because of the contrasting effects of above-average rainfall and the onset of tubewell development for irrigation. Due to a combination of low rainfall and increased tubewell development, approximately 70 km<sup>3</sup> of groundwater was lost at ~2.8 cm yr<sup>-1</sup> in the first decade of the twenty-first century. Our results demonstrate how human and climatic drivers have combined to drive historical groundwater trends.

**链接:** <https://www.nature.com/articles/s41561-022-00926-1>

**(10) 标题:** Winter particulate pollution severity in North China driven by atmospheric teleconnections

**作者:** Jiandong Li, Xin Hao, Hong Liao .etc

**摘要:** Elevated levels of particulate matter in the atmosphere are hazardous to human health and the environment. Severe particulate pollution days, with daily mean PM<sub>2.5</sub> concentrations exceeding 150 μg m<sup>-3</sup>, occurred frequently in North China, especially during the boreal winters of 2013–2019. Severe particulate pollution generally occurs under conducive weather patterns characterized by a stable atmosphere with weak winds, under which air pollutants emitted at the surface by human activities would accumulate. The occurrence of conducive weather patterns has been attributed to variations in numerous climate factors such as Arctic sea-ice cover, sea surface temperature and atmospheric teleconnections, but the dominant climate drivers remain unclear. Here, we show that the East Atlantic–West Russia teleconnection pattern and the Victoria mode of sea surface temperature anomalies are the top two dominant climate drivers that lead to conducive weather patterns in North China through the zonal and meridional propagations of Rossby waves. Our results suggest that, with the help of seasonal forecast from climate models, indices of these two drivers can be

used to predict severe particulate pollution over North China for the coming winter, enabling us to protect human health by air-quality planning.

**链接:** <https://www.nature.com/articles/s41561-022-00933-2>

**(11)标题:** Thermochemical structure and evolution of cratonic lithosphere in central and southern Africa

**作者:** Juan C. Afonso, Walid Ben-Mansour, Suzanne Y. O'Reilly .etc

**摘要:** The thermochemical structure of the subcontinental mantle holds information on its origin and evolution that can inform energy and mineral exploration strategies, natural hazard mitigation and evolutionary models of Earth. However, imaging the fine-scale thermochemical structure of continental lithosphere remains a major challenge. Here we combine multiple land and satellite datasets via thermodynamically constrained inversions to obtain a high-resolution thermochemical model of central and southern Africa. Results reveal diverse structures and compositions for cratons, indicating distinct evolutions and responses to geodynamic processes. While much of the Kaapvaal lithosphere retained its cratonic features, the western Angolan–Kasai Shield and the Rehoboth Block have lost their cratonic keels. The lithosphere of the Congo Craton has been affected by metasomatism, increasing its density and inducing its conspicuous low-topography, geoid and magnetic anomalies. Our results reconcile mantle structure with the causes and location of volcanism within and around the Tanzanian Craton, whereas the absence of volcanism towards the north is due to local asthenospheric downwellings, not to a previously proposed lithospheric root connecting with the Congo Craton. Our study offers improved integration of mantle structure, magmatism and the evolution and destruction of cratonic lithosphere, and lays the groundwork for future lithospheric evolutionary models and exploration frameworks for Earth and other terrestrial planets.

**链接:** <https://www.nature.com/articles/s41561-022-00929-y>

**(12)标题:** Risks to carbon storage from land-use change revealed by peat thickness maps of Peru

**作者:** Adam Hastie, Eur ídice N. Honorio Coronado .etc

**摘要:** Tropical peatlands are among the most carbon-dense ecosystems but land-use change has led to the loss of large peatland areas, associated with substantial greenhouse gas emissions. To design effective conservation and restoration policies, maps of the location and carbon storage of tropical peatlands are vital. This is especially so in countries such as Peru where the distribution of its large,

hydrologically intact peatlands is poorly known. Here field and remote sensing data support the model development of peatland extent and thickness for lowland Peruvian Amazonia. We estimate a peatland area of 62,714 km<sup>2</sup> (5th and 95th confidence interval percentiles of 58,325 and 67,102 km<sup>2</sup>, respectively) and carbon stock of 5.4 (2.6–10.6) PgC, a value approaching the entire above-ground carbon stock of Peru but contained within just 5% of its land area. Combining the map of peatland extent with national land-cover data we reveal small but growing areas of deforestation and associated CO<sub>2</sub> emissions from peat decomposition due to conversion to mining, urban areas and agriculture. The emissions from peatland areas classified as forest in 2000 represent 1–4% of Peruvian CO<sub>2</sub> forest emissions between 2000 and 2016. We suggest that bespoke monitoring, protection and sustainable management of tropical peatlands are required to avoid further degradation and CO<sub>2</sub> emissions.

**链接:** <https://www.nature.com/articles/s41561-022-00923-4>

**(13) 标题:** Sea-level stability over geological time owing to limited deep subduction of hydrated mantle

**作者:** N. G. Cerpa, D. Arcay & J. A. Padrón-Navarta

**摘要:** Liquid surface oceans are a seemingly unique feature of Earth. Long-term, global sea level depends on the balance of water fluxes between Earth's mantle and surface: between mantle degassing through volcanism and mantle regassing via the subduction of hydrous minerals. However, the overall balance of these fluxes at geological timescales remains uncertain. Geological observations suggest the stability of the long-term sea level and thus a near-steady-state regassing–degassing balance. In contrast, according to current thermopetrological modelling, the global input of H<sub>2</sub>O inferred from geophysical observations leads to an unequivocal excess of regassing relative to degassing. Here we use recent experimental high-pressure data on natural hydrated peridotites to update the thermopetrological models and to reassess the calculations of H<sub>2</sub>O fluxes into the mantle via subduction. Our models of 56 subduction transects show that a global input of 15–20 × 10<sup>8</sup> TgH<sub>2</sub>O every million years yields a limited global mantle regassing of 2.0–3.5 × 10<sup>8</sup> TgH<sub>2</sub>O every million years. The regassing occurs exclusively via the hydrated lithospheric mantle of the coldest subducting plates. Our requantification of the H<sub>2</sub>O budget associated with subduction matches the estimations of mantle degassing and suggests that global sea levels have been relatively stable over geological timescales.

**链接:** <https://www.nature.com/articles/s41561-022-00924-3>

**(14) 标题:** Neogene South Asian monsoon rainfall and wind histories diverged due

to topographic effects

**作者:** Anta-Clarisse Sarr, Yannick Donnadieu, Clara T. Bolton .etc

**摘要:** The drivers of the evolution of the South Asian Monsoon remain widely debated. An intensification of monsoonal rainfall recorded in terrestrial and marine sediment archives from the earliest Miocene (23–20 million years ago (Ma)) is generally attributed to Himalayan uplift. However, Indian Ocean palaeorecords place the onset of a strong monsoon around 13 Ma, linked to strengthening of the southwesterly winds of the Somali Jet that also force Arabian Sea upwelling. Here we reconcile these divergent records using Earth system model simulations to evaluate the interactions between palaeogeography and ocean–atmosphere dynamics. We show that factors forcing the South Asian Monsoon circulation versus rainfall are decoupled and diachronous. Himalayan and Tibetan Plateau topography predominantly controlled early Miocene rainfall patterns, with limited impact on ocean–atmosphere circulation. The uplift of the East African and Middle Eastern topography played a pivotal role in the establishment of the modern Somali Jet structure above the western Indian Ocean, while strong upwelling initiated as a direct consequence of the emergence of the Arabian Peninsula and the onset of modern-like atmospheric circulation. Our results emphasize that although elevated rainfall seasonality was probably a persistent feature since the India–Asia collision in the Paleogene, modern-like monsoonal atmospheric circulation only emerged in the late Neogene.

**链接:** <https://www.nature.com/articles/s41561-022-00919-0>

**(15) 标题:** Secondary organic aerosol formed by condensing anthropogenic vapours over China's megacities

**作者:** Wei Nie, Chao Yan, Dan Dan Huang .etc

**摘要:** Secondary organic aerosol contributes a significant fraction to aerosol mass and toxicity. Low-volatility organic vapours are critical intermediates connecting the oxidation of volatile organic compounds to secondary organic aerosol formation. However, the direct measurement of intermediate vapours poses a great challenge. Here we present coordinated measurements of oxygenated organic molecules in the three most urbanized regions of China and determine their likely precursors, enabling us to connect secondary organic aerosol formation to various volatile organic compounds. We show that the oxidation of anthropogenic volatile organic compounds dominates oxygenated organic molecule formation, with an approximately 40% contribution from aromatics and a 40% contribution from aliphatic hydrocarbons (predominantly alkanes), a previously under-accounted class of volatile organic

compounds. The irreversible condensation of these anthropogenic oxygenated organic molecules increases significantly in highly polluted conditions, accounting for a major fraction of the production of secondary organic aerosol. We find that the distribution of oxygenated organic molecules and their formation pathways are largely the same across the urbanized regions. This suggests that uniform mitigation strategies could be effective in solving air pollution issues across these highly populated city clusters.

链接: <https://www.nature.com/articles/s41561-022-00922-5>

**(16) 标题:** Fluocerite as a precursor to rare earth element fractionation in ore-forming systems

**作者:** Andrew C. Strzelecki, Artas Migdisov, Hakim Boukhalfa .etc

**摘要:** Emerging renewable energy technologies and low-carbon transportation rely heavily on the unique optical and magnetic properties of the rare earth elements. The medium to heavy rare earth elements, neodymium to lutetium, are most sought by industry but are the least abundant in nature. Only a small proportion of known rare earth element deposits are enriched in these elements. Identifying additional sources of medium to heavy rare earth elements for resource exploration requires improved understanding of the mechanisms responsible for the formation of such highly fractionated deposits. Here we report the results of experiments demonstrating a mechanism that could lead to enrichment of medium to heavy rare earth elements in ore-forming hydrothermal systems. In our experiments, we simulated natural hydrothermal systems by heating a column containing apatite and fluorite through which we pumped a chloride-rich solution bearing rare earth elements. Analysis of our experiments shows that the fluoride mineral fluocerite can serve as a precursor phase that fractionates rare earth elements before it is subsequently converted to a thermodynamically more stable mineral. Our findings identify geological settings in which fluocerite is observed or predicted to occur as potential exploration targets for deposits enriched in medium to heavy rare earth elements.

链接: <https://www.nature.com/articles/s41561-022-00921-6>

**(17) 标题:** Atmospheric CO<sub>2</sub> control of spontaneous millennial-scale ice age climate oscillations

**作者:** Guido Vettoretti, Peter Ditlevsen, Markus Jochum .etc

**摘要:** Last Glacial millennial-scale climate variability transitioned through distinct cold stadial and warm interstadial states. Here we use Earth system model simulations to demonstrate that nonlinear self-sustained climate oscillations appear spontaneously within a window of glacial-level atmospheric CO<sub>2</sub> concentrations (~190–225 parts

per million). Outside this window, the system remains in either quasi-stable cold low CO<sub>2</sub> or warm high CO<sub>2</sub> states, with infrequent and abrupt random transitions driven by noise. In the oscillatory regime, the time between climate transitions is governed by temporal variations in the state of the ocean, atmosphere and sea ice, with CO<sub>2</sub> acting as a control on the relative rates of the internal forcing and feedback in the system. The Earth system model results map perfectly to a slow-fast dynamical systems model, where the fixed point of the system transitions into the oscillatory regime through a loss of stability at two critical tipping points, the window boundaries. The deterministic component of the oscillations is modified by a stochastic element associated with internal climate variability. Agreement between observations and the hierarchically disparate models suggests the existence of an internal stochastic climate oscillator, which tracks variations in atmospheric CO<sub>2</sub> level through the glacial, acting in concert with noise-induced transitions.

**链接:** <https://www.nature.com/articles/s41561-022-00920-7>

**(18) 标题:** Intense upper ocean mixing due to large aggregations of spawning fish

**作者:** Bieito Fernández Castro, Marian Peña, Enrique Nogueira .etc

**摘要:** Small-scale turbulent mixing plays a pivotal role in shaping ocean circulation and a broad range of physical and biogeochemical processes. Despite advances in our understanding of the geophysical processes responsible for this mixing, the nature and importance of biomixing—turbulent mixing caused by marine biota—are still debated. A major source of uncertainty pertains to the efficiency of biomixing (the fraction of the turbulent energy produced through swimming that is spent in mixing the ocean vertically), which the few in situ observations available suggest to be much lower than that of geophysical turbulence. Here we shed light on this problem by analysing 14 days of continuous measurements of centimetre-scale turbulence in an area of coastal upwelling. We show that turbulent dissipation is elevated 10- to 100-fold (reaching  $10^{-6}$ – $10^{-5}$  W kg<sup>-1</sup>) every night of the survey due to the swimming activity of large aggregations of anchovies that gather regularly over the spawning season. Turbulent mixing is invigorated concurrently with dissipation, and occurs with an efficiency comparable to that of geophysical turbulence. Our results demonstrate that biologically driven turbulence can be a highly effective mixing agent, and call for a re-examination of its impacts on productive upper ocean regions.

**链接:** <https://www.nature.com/articles/s41561-022-00916-3>

**(19) 标题:** Crater population on asteroid (101955) Bennu indicates impact armouring and a young surface

**作者:** E. B. Bierhaus, D. Trang, R. T. Daly .etc

**摘要:** The impactor-to-crater size scaling relationships that enable estimates of planetary surface ages rely on an accurate formulation of impactor–target physics. An armouring regime, specific to rubble-pile surfaces, has been proposed to occur when an impactor is comparable in diameter to a target surface particle (for example, a boulder). Armouring is proposed to reduce crater diameter, or prevent crater formation in the asteroid surface, at small crater diameters. Here, using measurements of 1,560 craters on the rubble-pile asteroid (101955) Bennu, we show that the boulder population controls a transition from crater formation to armouring at crater diameters ~2–3 m, below which crater formation in the bulk surface is increasingly rare. By combining estimates of impactor flux with the armouring scaling relationship, we find that Bennu’s crater retention age (surface age derived from crater abundance) spans from 1.6–2.2 Myr for craters less than a few meters to ~10–65 Myr for craters >100 m in diameter, reducing the maximum surface age by a factor of >15 relative to previous estimates. The range of crater retention ages, together with latitudinal variations in large-crater spatial density, indicate that ongoing resurfacing processes render the surface many times younger than the bulk asteroid.

**链接:** <https://www.nature.com/articles/s41561-022-00914-5>

**(20) 标题:** Sea spray as an obscured source for marine cloud nuclei

**作者:** Wei Xu, Jurgita Ovadnevaite, Kirsten N. Fossum .etc

**摘要:** Sea spray aerosols (SSAs) make up a substantial proportion of aerosols in the global atmosphere and, especially when considering marine haze and cloud layers, can have a large impact on cloud formation and atmospheric radiative balance. Although SSA has the highest cloud condensation nuclei (CCN) activation potential, the majority of its population, residing in sub-micrometre sizes, are often obscured by non-sea-spray CCN. Quantification of SSA-derived CCN is fundamental in understanding the radiative budget. Recent approaches to estimate the sub-micrometre SSA employed a free-monomodal lognormal analysis that depicts the global oceanic CCN population comprising less than 30% SSA. Here we derive SSA distributions from a unique five-year dataset of aerosol microphysics and hygroscopicity (water uptake ability) over Atlantic waters. This approach utilizes the distinctive ultra-high hygroscopicity signature of inorganic sea salt and is able to identify the sub-micrometre sea spray down to 35 nm diameter with high time and size resolution. In stark contrast to previous studies, the hygroscopicity coupled multimodal fitting analysis yields SSA-derived CCN as much as 500% in excess of estimates produced

using the free-monomodal approach. Our results suggest the contribution of SSA to global CCN, particularly Aitken mode SSA, has probably been overlooked.

链接: <https://www.nature.com/articles/s41561-022-00917-2>

#### 4. Nature Nanotechnology

(1) 标题: Giant magnetochiral anisotropy from quantum-confined surface states of topological insulator nanowires

作者: Henry F. Legg, Matthias Röβler, Felix Müning .etc

摘要: Wireless technology relies on the conversion of alternating electromagnetic fields into direct currents, a process known as rectification. Although rectifiers are normally based on semiconductor diodes, quantum mechanical non-reciprocal transport effects that enable a highly controllable rectification were recently discovered. One such effect is magnetochiral anisotropy (MCA), in which the resistance of a material or a device depends on both the direction of the current flow and an applied magnetic field. However, the size of rectification possible due to MCA is usually extremely small because MCA relies on inversion symmetry breaking that leads to the manifestation of spin-orbit coupling, which is a relativistic effect. In typical materials, the rectification coefficient  $\gamma$  due to MCA is usually  $|\gamma| \lesssim 1 \text{ A}^{-1} \text{ T}^{-1}$  and the maximum values reported so far are  $|\gamma| \approx 100 \text{ A}^{-1} \text{ T}^{-1}$  in carbon nanotubes<sup>13</sup> and ZrTe<sub>5</sub>. Here, to overcome this limitation, we artificially break the inversion symmetry via an applied gate voltage in thin topological insulator (TI) nanowire heterostructures and theoretically predict that such a symmetry breaking can lead to a giant MCA effect. Our prediction is confirmed via experiments on thin bulk-insulating (Bi<sub>1-x</sub>Sb<sub>x</sub>)<sub>2</sub>Te<sub>3</sub> (BST) TI nanowires, in which we observe an MCA consistent with theory and  $|\gamma| \approx 100,000 \text{ A}^{-1} \text{ T}^{-1}$ , a very large MCA rectification coefficient in a normal conductor.

链接: <https://www.nature.com/articles/s41565-022-01124-1>

(2) 标题: Enhancing CRISPR/Cas gene editing through modulating cellular mechanical properties for cancer therapy

作者: Di Zhang, Guoxun Wang, Xueliang Yu .etc

摘要: Genome editing holds great potential for cancer treatment due to the ability to precisely inactivate or repair cancer-related genes. However, delivery of CRISPR/Cas to solid tumours for efficient cancer therapy remains challenging. Here we targeted tumour tissue mechanics via a multiplexed dendrimer lipid nanoparticle (LNP) approach involving co-delivery of focal adhesion kinase (FAK) siRNA, Cas9 mRNA

and sgRNA (siFAK + CRISPR-LNPs) to enable tumour delivery and enhance gene-editing efficacy. We show that gene editing was enhanced >10-fold in tumour spheroids due to increased cellular uptake and tumour penetration of nanoparticles mediated by FAK-knockdown. siFAK + CRISPR-PD-L1-LNPs reduced extracellular matrix stiffness and efficiently disrupted PD-L1 expression by CRISPR/Cas gene editing, which significantly inhibited tumour growth and metastasis in four mouse models of cancer. Overall, we provide evidence that modulating the stiffness of tumour tissue can enhance gene editing in tumours, which offers a new strategy for synergistic LNPs and other nanoparticle systems to treat cancer using gene editing.

**链接:** <https://www.nature.com/articles/s41565-022-01122-3>

**(3) 标题:** Reconfigurable training and reservoir computing in an artificial spin-vortex ice via spin-wave fingerprinting

**作者:** Jack C. Gartside, Kilian D. Stenning, Alex Vanstone .etc

**摘要:** Strongly interacting artificial spin systems are moving beyond mimicking naturally occurring materials to emerge as versatile functional platforms, from reconfigurable magnonics to neuromorphic computing. Typically, artificial spin systems comprise nanomagnets with a single magnetization texture: collinear macrospins or chiral vortices. By tuning nanoarray dimensions we have achieved macrospin–vortex bistability and demonstrated a four-state metamaterial spin system, the ‘artificial spin-vortex ice’ (ASVI). ASVI can host Ising-like macrospins with strong ice-like vertex interactions and weakly coupled vortices with low stray dipolar field. Vortices and macrospins exhibit starkly differing spin-wave spectra with analogue mode amplitude control and mode frequency shifts of  $\Delta f = 3.8$  GHz. The enhanced bitextural microstate space gives rise to emergent physical memory phenomena, with ratchet-like vortex injection and history-dependent non-linear fading memory when driven through global magnetic field cycles. We employed spin-wave microstate fingerprinting for rapid, scalable readout of vortex and macrospin populations, and leveraged this for spin-wave reservoir computation. ASVI performs non-linear mapping transformations of diverse input and target signals in addition to chaotic time-series forecasting.

**链接:** <https://www.nature.com/articles/s41565-022-01091-7>

**(4) 标题:** Electric control of valley polarization in monolayer WSe<sub>2</sub> using a van der Waals magnet

**作者:** Jia-Xin Li, Wei-Qing Li, Sheng-Hsiung Hung .etc

**摘要:** Electrical manipulation of the valley degree of freedom in transition metal

dichalcogenides is central to developing valleytronics. Towards this end, ferromagnetic contacts, such as Ga(Mn)As and permalloy, have been exploited to inject spin-polarized carriers into transition metal dichalcogenides to realize valley-dependent polarization. However, these materials require either a high external magnetic field or complicated epitaxial growth steps, limiting their practical applications. Here we report van der Waals heterostructures based on a monolayer WSe<sub>2</sub> and an Fe<sub>3</sub>GeTe<sub>2</sub>/hexagonal boron nitride ferromagnetic tunnelling contact that under a bias voltage can effectively inject spin-polarized holes into WSe<sub>2</sub>, leading to a population imbalance between  $\pm K$  valleys, as confirmed by density functional theory calculations and helicity-dependent electroluminescence measurements. Under an external magnetic field, we observe that the helicity of electroluminescence flips its sign and exhibits a hysteresis loop in agreement with the magnetic hysteresis loop obtained from reflective magnetic circular dichroism characterizations on Fe<sub>3</sub>GeTe<sub>2</sub>. Our results could address key challenges of valleytronics and prove promising for van der Waals magnets for magneto-optoelectronics applications.

链接: <https://www.nature.com/articles/s41565-022-01115-2>

(5) 标题: Efficient conversion of low-concentration nitrate sources into ammonia on a Ru-dispersed Cu nanowire electrocatalyst

作者: Feng-Yang Chen, Zhen-Yu Wu, Srishti Gupta .etc

摘要: Electrochemically converting nitrate ions, a widely distributed nitrogen source in industrial wastewater and polluted groundwater, into ammonia represents a sustainable route for both wastewater treatment and ammonia generation. However, it is currently hindered by low catalytic activities, especially under low nitrate concentrations. Here we report a high-performance Ru-dispersed Cu nanowire catalyst that delivers an industrial-relevant nitrate reduction current of 1 A cm<sup>-2</sup> while maintaining a high NH<sub>3</sub> Faradaic efficiency of 93%. More importantly, this high nitrate-reduction catalytic activity enables over a 99% nitrate conversion into ammonia, from an industrial wastewater level of 2,000 ppm to a drinkable water level <50 ppm, while still maintaining an over 90% Faradaic efficiency. Coupling the nitrate reduction effluent stream with an air stripping process, we successfully obtained high purity solid NH<sub>4</sub>Cl and liquid NH<sub>3</sub> solution products, which suggests a practical approach to convert wastewater nitrate into valuable ammonia products. Density functional theory calculations reveal that the highly dispersed Ru atoms provide active nitrate reduction sites and the surrounding Cu sites can suppress the

main side reaction, the hydrogen evolution reaction.

**链接:** <https://www.nature.com/articles/s41565-022-01121-4>

**(6) 标题:** Performance descriptors of nanostructured metal catalysts for acetylene hydrochlorination

**作者:** Selina K. Kaiser, Edvin Fako, Ivan Surin .etc

**摘要:** Controlling the precise atomic architecture of supported metals is central to optimizing their catalytic performance, as recently exemplified for nanostructured platinum and ruthenium systems in acetylene hydrochlorination, a key process for vinyl chloride production. This opens the possibility of building on historically established activity correlations. In this study, we derived quantitative activity, selectivity and stability descriptors that account for the metal-dependent speciation and host effects observed in acetylene hydrochlorination. To achieve this, we generated a platform of Au, Pt, Ru, Ir, Rh and Pd single atoms and nanoparticles supported on different types of carbon and assessed their evolution during synthesis and under the relevant reaction conditions. Combining kinetic, transient and chemisorption analyses with modelling, we identified the acetylene adsorption energy as a speciation-sensitive activity descriptor, further determining catalyst selectivity with respect to coke formation. The stability of the different nanostructures is governed by the interplay between single atom–support interactions and chlorine affinity, promoting metal redispersion or agglomeration, respectively.

**链接:** <https://www.nature.com/articles/s41565-022-01105-4>

**(7) 标题:** Highly shape- and size-tunable membrane nanopores made with DNA

**作者:** Yongzheng Xing, Adam Dorey, Lakmal Jayasinghe .etc

**摘要:** Membrane nanopores are key for molecular transport in biology, portable DNA sequencing, label-free single-molecule analysis and nanomedicine. Transport traditionally relies on barrel-like channels of a few nanometres width, but there is considerable scientific and technological interest for much wider structures of tunable shape. Yet, these nanopores do not exist in nature and are challenging to build using existing de novo routes for proteins. Here, we show that rational design with DNA can drastically expand the structural and functional range of membrane nanopores. Our design strategy bundles DNA duplexes into pore subunits that modularly arrange to form tunable pore shapes and lumen widths of up to tens of nanometres. Functional units for recognition or signalling can be optionally attached. By dialling in essential parameters, we demonstrate the utility and potential of the custom-engineered nanopores by electrical direct single-molecule sensing of 10-nm-sized proteins using

widely used research and hand-held analysis devices. The designer nanopores illustrate how DNA nanotechnology can deliver functional biomolecular structures to be used in synthetic biology, single-molecule enzymology and biophysical analysis, as well as portable diagnostics and environmental screening.

链接: <https://www.nature.com/articles/s41565-022-01116-1>

(8) 标题: Advancing osmotic power generation by covalent organic framework monolayer

作者: Jinlei Yang, Bin Tu, Guangjie Zhang .etc

摘要: Osmotic power, also known as ‘blue energy’, is produced by mixing solutions of different salt concentrations, and represents a vast, sustainable and clean energy source. The efficiency of harvesting osmotic power is primarily determined by the transmembrane performance, which is in turn dependent on ion conductivity and selectivity towards positive or negative ions. Atomically or molecularly thin membranes with a uniform pore environment and high pore density are expected to possess an outstanding ion permeability and selectivity, but remain unexplored. Here we demonstrate that covalent organic framework monolayer membranes that feature a well-ordered pore arrangement can achieve an extremely low membrane resistivity and ultrahigh ion conductivity. When used as osmotic power generators, these membranes produce an unprecedented output power density over  $200 \text{ W m}^{-2}$  on mixing the artificial seawater and river water. This work opens up the application of porous monolayer membranes with an atomically precise structure in osmotic power generation.

链接: <https://www.nature.com/articles/s41565-022-01110-7>

(9) 标题: Migrating photon avalanche in different emitters at the nanoscale enables 46th-order optical nonlinearity

作者: Yusen Liang, Zhimin Zhu, Shuqian Qiao .etc

摘要: A photon avalanche (PA) effect that occurs in lanthanide-doped solids gives rise to a giant nonlinear response in the luminescence intensity to the excitation light intensity. As a result, much weaker lasers are needed to evoke such PAs than for other nonlinear optical processes. Photon avalanches are mostly restricted to bulk materials and conventionally rely on sophisticated excitation schemes, specific for each individual system. Here we show a universal strategy, based on a migrating photon avalanche (MPA) mechanism, to generate huge optical nonlinearities from various lanthanide emitters located in multilayer core/shell nanostructures. The core of the MPA nanoparticle, composed of  $\text{Yb}^{3+}$  and  $\text{Pr}^{3+}$  ions, activates avalanche looping cycles, where PAs are synchronously achieved for both  $\text{Yb}^{3+}$  and  $\text{Pr}^{3+}$  ions under 852 nm laser excitation. These nanocrystals exhibit a 26th-order nonlinearity and a clear pumping threshold of  $60 \text{ kW cm}^{-2}$ . In addition, we demonstrate that the

avalanching Yb<sup>3+</sup> ions can migrate their optical nonlinear response to other emitters (for example, Ho<sup>3+</sup> and Tm<sup>3+</sup>) located in the outer shell layer, resulting in an even higher-order nonlinearity (up to the 46th for Tm<sup>3+</sup>) due to further cascading multiplicative effects. Our strategy therefore provides a facile route to achieve giant optical nonlinearity in different emitters. Finally, we also demonstrate applicability of MPA emitters to bioimaging, achieving a lateral resolution of ~62 nm using one low-power 852 nm continuous-wave laser beam.

链接: <https://www.nature.com/articles/s41565-022-01101-8>

(10) 标题: A robust all-organic protective layer towards ultrahigh-rate and large-capacity Li metal anodes

作者: Shimei Li, Junlong Huang, Yin Cui .etc

摘要: The low cycling efficiency and uncontrolled dendrite growth resulting from an unstable and heterogeneous lithium–electrolyte interface have largely hindered the practical application of lithium metal batteries. In this study, a robust all-organic interfacial protective layer has been developed to achieve a highly efficient and dendrite-free lithium metal anode by the rational integration of porous polymer-based molecular brushes (poly(oligo(ethylene glycol) methyl ether methacrylate)-grafted, hypercrosslinked poly(4 - chloromethylstyrene) nanospheres, denoted as xPCMS-g-PEGMA) with single-ion-conductive lithiated Nafion. The porous xPCMS inner cores with rigid hypercrosslinked skeletons substantially increase mechanical robustness and provide adequate channels for rapid ionic conduction, while the flexible PEGMA and lithiated Nafion polymers enable the formation of a structurally stable artificial protective layer with uniform Li<sup>+</sup> diffusion and high Li<sup>+</sup> transference number. With such artificial solid electrolyte interphases, ultralong-term stable cycling at an ultrahigh current density of 10 mA cm<sup>-2</sup> for over 9,100 h (>1 year) and unprecedented reversible lithium plating/stripping (over 2,800 h) at a large areal capacity (10 mAh cm<sup>-2</sup>) have been achieved for lithium metal anodes. Moreover, the protected anodes also show excellent cell stability when paired with high-loading cathodes (~4 mAh cm<sup>-2</sup>), demonstrating great prospects for the practical application of lithium metal batteries.

链接: <https://www.nature.com/articles/s41565-022-01107-2>

(11) 标题: Single-crystalline TiO<sub>2</sub> nanoparticles for stable and efficient perovskite modules

作者: Yong Ding, Bin Ding, Hiroyuki Kanda .etc

摘要: Despite the remarkable progress in power conversion efficiency of perovskite

solar cells, going from individual small-size devices into large-area modules while preserving their commercial competitiveness compared with other thin-film solar cells remains a challenge. Major obstacles include reduction of both the resistive losses and intrinsic defects in the electron transport layers and the reliable fabrication of high-quality large-area perovskite films. Here we report a facile solvothermal method to synthesize single-crystalline TiO<sub>2</sub> rhombohedral nanoparticles with exposed (001) facets. Owing to their low lattice mismatch and high affinity with the perovskite absorber, their high electron mobility and their lower density of defects, single-crystalline TiO<sub>2</sub> nanoparticle-based small-size devices achieve an efficiency of 24.05% and a fill factor of 84.7%. The devices maintain about 90% of their initial performance after continuous operation for 1,400 h. We have fabricated large-area modules and obtained a certified efficiency of 22.72% with an active area of nearly 24 cm<sup>2</sup>, which represents the highest-efficiency modules with the lowest loss in efficiency when scaling up.

链接: <https://www.nature.com/articles/s41565-022-01108-1>

(12) 标题: Light-driven microdrones

作者: Xiaofei Wu, Raphael Ehehalt, Gary Razinskas .etc

摘要: When photons interact with matter, forces and torques occur due to the transfer of linear and angular momentum, respectively. The resulting accelerations are small for macroscopic objects but become substantial for microscopic objects with small masses and moments of inertia, rendering photon recoil very attractive to propel micro- and nano-objects. However, until now, using light to control object motion in two or three dimensions in all three or six degrees of freedom has remained an unsolved challenge. Here we demonstrate light-driven microdrones (size roughly 2 μm and mass roughly 2 pg) in an aqueous environment that can be manoeuvred in two dimensions in all three independent degrees of freedom (two translational and one rotational) using two overlapping unfocused light fields of 830 and 980 nm wavelength. To actuate the microdrones independent of their orientation, we use up to four individually addressable chiral plasmonic nanoantennas acting as nanomotors that resonantly scatter the circular polarization components of the driving light into well-defined directions. The microdrones are manoeuvred by only adjusting the optical power for each motor (the power of each circular polarization component of each wavelength). The actuation concept is therefore similar to that of macroscopic multirotor drones. As a result, we demonstrate manual steering of the microdrones along complex paths. Since all degrees of freedom can be addressed independently

and directly, feedback control loops may be used to counteract Brownian motion. We posit that the microdrones can find applications in transport and release of cargos, nanomanipulation, and local probing and sensing of nano and mesoscale objects.

链接: <https://www.nature.com/articles/s41565-022-01099-z>

(13) 标题: Exceptional points in lossy media lead to deep polynomial wave penetration with spatially uniform power loss

作者: Alexander Yulaev, Sangsik Kim, Qing Li .etc

摘要: Waves entering a spatially uniform lossy medium typically undergo exponential intensity decay, arising from either the energy loss of the Beer–Lambert–Bouguer transmission law or the evanescent penetration during reflection. Recently, exceptional point singularities in non-Hermitian systems have been linked to unconventional wave propagation. Here, we theoretically propose and experimentally demonstrate exponential decay free wave propagation in a purely lossy medium. We observe up to 400-wave deep polynomial wave propagation accompanied by a uniformly distributed energy loss across a nanostructured photonic slab waveguide with exceptional points. We use coupled-mode theory and fully vectorial electromagnetic simulations to predict deep wave penetration manifesting spatially constant radiation losses through the entire structured waveguide region regardless of its length. The uncovered exponential decay free wave phenomenon is universal and holds true across all domains supporting physical waves, finding immediate applications for generating large, uniform and surface-normal free-space plane waves directly from dispersion-engineered photonic chip surfaces.

链接: <https://www.nature.com/articles/s41565-022-01114-3>

(14) 标题: Bilayer WSe<sub>2</sub> as a natural platform for interlayer exciton condensates in the strong coupling limit

作者: Qianhui Shi, En-Min Shih, Daniel Rhodes .etc

摘要: Exciton condensates (ECs) are macroscopic coherent states arising from condensation of electron–hole pairs<sup>1</sup>. Bilayer heterostructures, consisting of two-dimensional electron and hole layers separated by a tunnel barrier, provide a versatile platform to realize and study ECs<sup>2,3,4</sup>. The tunnel barrier suppresses recombination, yielding long-lived excitons<sup>5,6,7,8,9,10</sup>. However, this separation also reduces interlayer Coulomb interactions, limiting the exciton binding strength. Here, we report the observation of ECs in naturally occurring 2H-stacked bilayer WSe<sub>2</sub>. In this system, the intrinsic spin–valley structure suppresses interlayer tunnelling even when the separation is reduced to the atomic limit, providing access to a previously

unattainable regime of strong interlayer coupling. Using capacitance spectroscopy, we investigate magneto-ECs, formed when partially filled Landau levels couple between the layers. We find that the strong-coupling ECs show dramatically different behaviour compared with previous reports, including an unanticipated variation of EC robustness with the orbital number, and find evidence for a transition between two types of low-energy charged excitations. Our results provide a demonstration of tuning EC properties by varying the constituent single-particle wavefunctions.

链接: <https://www.nature.com/articles/s41565-022-01104-5>

(15) 标题: A high-performance hydroxide exchange membrane enabled by Cu<sup>2+</sup>-crosslinked chitosan

作者: Meiling Wu, Xin Zhang, Yun Zhao .etc

摘要: Ion exchange membranes are widely used to selectively transport ions in various electrochemical devices. Hydroxide exchange membranes (HEMs) are promising to couple with lower cost platinum-free electrocatalysts used in alkaline conditions, but are not stable enough in strong alkaline solutions. Herein, we present a Cu<sup>2+</sup>-crosslinked chitosan (chitosan-Cu) material as a stable and high-performance HEM. The Cu<sup>2+</sup> ions are coordinated with the amino and hydroxyl groups of chitosan to crosslink the chitosan chains, forming hexagonal nanochannels (~1 nm in diameter) that can accommodate water diffusion and facilitate fast ion transport, with a high hydroxide conductivity of 67 mS cm<sup>-1</sup> at room temperature. The Cu<sup>2+</sup> coordination also enhances the mechanical strength of the membrane, reduces its permeability and, most importantly, improves its stability in alkaline solution (only 5% conductivity loss at 80 °C after 1,000 h). These advantages make chitosan-Cu an outstanding HEM, which we demonstrate in a direct methanol fuel cell that exhibits a high power density of 305 mW cm<sup>-2</sup>. The design principle of the chitosan-Cu HEM, in which ion transport channels are generated in the polymer through metal-crosslinking of polar functional groups, could inspire the synthesis of many ion exchange membranes for ion transport, ion sieving, ion filtration and more.

链接: <https://www.nature.com/articles/s41565-022-01112-5>

(16) 标题: Endoepitaxial growth of monolayer mosaic heterostructures

作者: Zhengwei Zhang, Ziwei Huang, Jia Li .etc

摘要: The controllable growth of two-dimensional (2D) heterostructure arrays is critical for exploring exotic physics and developing novel devices, yet it remains a substantial synthetic challenge. Here we report a rational synthetic strategy to fabricate mosaic heterostructure arrays in monolayer 2D atomic crystals. By using a

laser-patterning and an anisotropic thermal etching process, we create periodic triangular hole arrays in 2D crystals with precisely controlled size and atomically clean edges, which function as robust templates for endoeptaxial growth of another 2D crystal, to obtain monolayer mosaic heterostructures with atomically sharp heterojunction interfaces. Systematic microstructure and spectroscopic characterizations reveal periodic modulation of chemical compositions, lattice strains and electronic band gaps throughout the mosaic heterostructures. The robust growth of the monolayer mosaic heterostructures with a high level of synthetic control opens a pathway for band structure engineering and spatially modulating the potential landscapes in the atomically thin 2D crystals, establishing a designable material platform for fundamental studies and development of complex devices and integrated circuits from 2D heterostructures.

**链接:** <https://www.nature.com/articles/s41565-022-01106-3>

**(17) 标题:** Probing nanomotion of single bacteria with graphene drums

**作者:** Irek E. Rosłoń, Aleksandre Japaridze, Peter G. Steeneken .etc

**摘要:** Motion is a key characteristic of every form of life<sup>1</sup>. Even at the microscale, it has been reported that colonies of bacteria can generate nanomotion on mechanical cantilevers<sup>2</sup>, but the origin of these nanoscale vibrations has remained unresolved<sup>3,4</sup>. Here, we present a new technique using drums made of ultrathin bilayer graphene, where the nanomotion of single bacteria can be measured in its aqueous growth environment. A single *Escherichia coli* cell is found to generate random oscillations with amplitudes of up to 60 nm, exerting forces of up to 6 nN to its environment. Using mutant strains that differ by single gene deletions that affect motility, we are able to pinpoint the bacterial flagella as the main source of nanomotion. By real-time tracing of changes in nanomotion on administering antibiotics, we demonstrate that graphene drums can perform antibiotic susceptibility testing with single-cell sensitivity. These findings deepen our understanding of processes underlying cellular dynamics, and pave the way towards high-throughput and parallelized rapid screening of the effectiveness of antibiotics in bacterial infections with graphene devices.

**链接:** <https://www.nature.com/articles/s41565-022-01111-6>

**(18) 标题:** Tailoring solid-state single-photon sources with stimulated emissions

**作者:** Yuming Wei, Shunfa Liu, Xueshi Li .etc

**摘要:** The coherent interaction of electromagnetic fields with solid-state two-level systems can yield deterministic quantum light sources for photonic quantum technologies. To date, the performance of semiconductor single-photon sources based

on three-level systems is limited mainly due to a lack of high photon indistinguishability. Here we tailor the cavity-enhanced spontaneous emission from a ladder-type three-level system in a single epitaxial quantum dot through stimulated emission. After populating the biexciton (XX) of the quantum dot through two-photon resonant excitation, we use another laser pulse to selectively depopulate the XX state into an exciton (X) state with a predefined polarization. The stimulated XX–X emission modifies the X decay dynamics and improves the characteristics of a polarized single-photon source, such as a source brightness of 0.030(2), a single-photon purity of 0.998(1) and an indistinguishability of 0.926(4). Our method can be readily applied to existing quantum dot single-photon sources and expands the capabilities of three-level systems for advanced quantum photonic functionalities.

**链接:** <https://www.nature.com/articles/s41565-022-01092-6>

**(19) 标题:** A nanovaccine for antigen self-presentation and immunosuppression reversal as a personalized cancer immunotherapy strategy

**作者:** Chao Liu, Xue Liu, Xinchu Xiang .etc

**摘要:** The strategy of combining a vaccine with immune checkpoint inhibitors has been widely investigated in cancer management, but the complete response rate for this strategy is still unresolved. We describe a genetically engineered cell membrane nanovesicle that integrates antigen self-presentation and immunosuppression reversal (ASPIRE) for cancer immunotherapy. The ASPIRE nanovaccine is derived from recombinant adenovirus-infected dendritic cells in which specific peptide-major histocompatibility complex class I (pMHC-I), anti-PD1 antibody and B7 co-stimulatory molecules are simultaneously anchored by a programmed process. ASPIRE can markedly improve antigen delivery to lymphoid organs and generate broad-spectrum T-cell responses that eliminate established tumours. This work presents a powerful vaccine formula that can directly activate both native T cells and exhausted T cells, and suggests a general strategy for personalized cancer immunotherapy.

**链接:** <https://www.nature.com/articles/s41565-022-01098-0>

**(20) 标题:** Cross-species transcriptomic signatures identify mechanisms related to species sensitivity and common responses to nanomaterials

**作者:** Becky J. Curtis, Nicholas J. Niemuth, Evan Bennett .etc

**摘要:** Physico-chemical characteristics of engineered nanomaterials are known to be important in determining the impact on organisms but effects are equally dependent upon the characteristics of the organism exposed. Species sensitivity may vary by

orders of magnitude, which could be due to differences in the type or magnitude of the biochemical response, exposure or uptake of nanomaterials. Synthesizing conclusions across studies and species is difficult as multiple species are not often included in a study, and differences in batches of nanomaterials, the exposure duration and media across experiments confound comparisons. Here three model species, *Danio rerio*, *Daphnia magna* and *Chironomus riparius*, that differ in sensitivity to lithium cobalt oxide nanosheets are found to differ in immune-response, iron-sulfur protein and central nervous system pathways, among others. Nanomaterial uptake and dissolution does not fully explain cross-species differences. This comparison provides insight into how biomolecular responses across species relate to the varying sensitivity to nanomaterials.

链接: <https://www.nature.com/articles/s41565-022-01096-2>

(21) 标题: Pumping between phases with a pulsed-fuel molecular ratchet

作者: Dean Thomas, Daniel J. Tetlow, Yansong Ren .etc

摘要: The sorption of species from a solution into and onto solids underpins the sequestering of waste and pollutants, precious metal recovery, heterogeneous catalysis, analysis and separation science, and other technologies. The transfer between phases tends to proceed spontaneously in the direction of equilibrium. For example, alkyl ammonium groups mounted on silica nanoparticles are used to chemisorb cucurbituril macrocycles from solution through host-guest binding. Molecular ratchet mechanisms in which kinetic gating inhibits or accelerates particular steps, makes it possible to progressively drive dynamic systems away from equilibrium. Here we report on molecular pumps immobilized on polymer beads that use an energy ratchet mechanism to directionally transport substrates from solution onto the beads. On the addition of trichloroacetic acid ( $\text{CCl}_3\text{CO}_2\text{H}$ ) fuel, micrometre-diameter polystyrene beads functionalized with solvent-accessible molecular pumps sequester from the solution crown ethers appended with fluorescent tags. After fuel consumption, the rings are mechanically trapped in a higher-energy, out-of-equilibrium state on the beads and cannot be removed by dilution or exhaustive washing. This differs from dissipative assembled materials, which require a continuous supply of energy to persist, and from conventional host-guest complexes. The addition of a second fuel pulse causes the uptake of more macrocycles, which drives the system further away from equilibrium. The second macrocycle can be labelled with a different fluorescent tag, which confers sequence information on the absorbed structure. The polymer-bound substrates can be released back to the bulk either one compartment at

a time or all at once. Non-equilibrium sorption by immobilized artificial molecular machines enables the transduction of energy from chemical fuels for the use, storage and release of energy and information.

链接: <https://www.nature.com/articles/s41565-022-01097-1>

(22) 标题: Wafer-scale monolithic integration of full-colour micro-LED display using MoS<sub>2</sub> transistor

作者: Sumin Hwangbo, Luhing Hu, Anh Tuan Hoang .etc

摘要: Large-scale growth of transition metal dichalcogenides and their subsequent integration with compound semiconductors is one of the major obstacles for two-dimensional materials implementation in optoelectronics applications such as active matrix displays or optical sensors. Here we present a novel transition metal dichalcogenide-on-compound-semiconductor fabrication method that is compatible with a batch microfabrication process. We show how a thin film of molybdenum disulfide (MoS<sub>2</sub>) can be directly synthesized on a gallium-nitride-based epitaxial wafer to form a thin film transistor array. Subsequently, the MoS<sub>2</sub> thin film transistor was monolithically integrated with micro-light-emitting-diode (micro-LED) devices to produce an active matrix micro-LED display. In addition, we demonstrate a simple approach to obtain red and green colours through the printing of quantum dots on a blue micro-LED, which allows for the scalable fabrication of full-colour micro-LED displays. This strategy represents a promising route to attain heterogeneous integration, which is essential for high-performance optoelectronic systems that can incorporate the established semiconductor technology and emerging two-dimensional materials.

链接: <https://www.nature.com/articles/s41565-022-01102-7>

## 一. 国外交通运输工程发展动态关注（二）

为服务我校交通运输工程学科建设与发展，本报告将分期呈现目前国外交通运输工程学术水平较高的高校、机构，以及值得关注的研究人员、研究方向，为我校交通运输工程学科建设发展提供参考。

上期报告为我校师生推荐了几所交通运输工程领域内值得关注的国外院校。本期报告选择这些院校中的一些代表性学者，展示其研究领域、近期关注和学术成果，供师生参考。

推荐关注学者的信息通过整理学者官方 Profile、CV 与学术成果、近期学术新闻获得，如存在信息整理的错误，请联系本栏目编辑，以便于在后续报告中勘误。由于学术水平和分析能力有限，制作过程中难免存在主观局限，不足之处敬请批评指正、提出宝贵建议。

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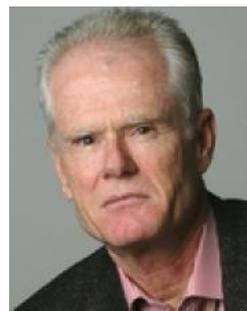
## 1. Carlos F. Daganzo

卡洛斯·弗朗西斯·达甘佐

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### 1.1 简介

美国国家工程院 (National Academy of Engineering) 院士, 也是 Via Analytics 的联合创始人、董事会主席和首席科学家。他曾担任最早的国际运输和交通理论研讨会 (ISTTT) 的召集人以及《运输研究与运输科学》的副主编。

Carlos F. Daganzo 以对计量经济学、物流学、货运运营、网络理论、交通流和运输运营的贡献而闻名, 他著有五本国际通用和翻译的书籍。特别是, 他最新的一本关于公共交通的

书描述了巴塞罗那新的高性能公交系统的蓝图, 这是 Carlos F. Daganzo 发明并共同设计的, 西班牙巴塞罗那加泰罗尼亚理工大学为了表彰他这项工作授予他荣誉博士学位。2011 年的 ISTTT 研讨会表彰了他对交通科学的累积贡献。2018 年, Carlos F. Daganzo 被任命为北京市的海外高级人才战略科学家, 负责构思和监督北京市的交通运输总体规划。2019 年, Carlos F. Daganzo 被公认为 50 年历史上著名的交通研究期刊系列中“最杰出的作者”。

### 1.2 近期研究方向/活动

(1) 关注中国交通问题。

(2) 《四个物理学故事及其对中国未来交通的影响》(科学想象力如何解决交通问题)

交通问题中一些大视野的需要抽象的思维; 不能仅仅通过推断现实世界的观察来回答, 譬如, 为什么交通系统似乎不能很好地服务于大城市? 为什么许多公共汽车系统如此不可靠和无序? 我们为此可以做些什么? 有没有可能在不建造任何东西的情况下, 扩大像 BART (旧金山湾区快速交通管理局经营的快速有轨公共交通系统) 这样拥挤的地铁的容量? 科技公司所提供的新的、灵活的交通模式可以为不同类型的城市做什么? 他们的服务是一种帮助还是一种阻碍? 是否

应该对这些公司进行监管？又该如何监管？回答这些问题，需要我们使用“科学想象力”；也就是说，我们创造出有用的概念，这些概念不仅仅是对现状的推断，而是大胆的形象性改变，在想象中的现实世界中发挥作用。当然，为了实现后者，这些概念必须符合（运输）物理学的规律。这就是为什么想象力必须是“科学”的。

(3) 2019 年 2 月 28 日演讲《Four Physics Stories and their Effect on China's Future Mobility》（四个物理故事及其对中国未来交通的影响）

演讲主要内容：用四个小故事将被用来说明物理学和想象力如何被用来诊断和补救当今世界一些大城市所面临的一些关键的城市交通问题。所有故事的共同点是，它们以新的方式解决重要的问题，其中心思想可以用基本的物理学原理向非专业人士进行直观描述。讲座还将讨论这些故事如何影响了中国城市交通的发展方向。

（演讲视频参见 <https://ce.berkeley.edu/news/2127>）



表 1 讲座展示

### 1.3 代表出版物/文章：

#### 书籍：

(1) Public Transportation Systems: Basic Principles of System Design, Operations Planning and Real-Time Control (revised and enlarged edition, 2019)

(2) Fundamentals of Transportation and Traffic Operations, Emerald, Inc. (2008)

(3) A Theory of Supply Chains, Springer-Verlag, Heidelberg, Germany (2003)

(4) Logistics Systems Analysis, Springer-Verlag, Heidelberg, Germany 4th revised and enlarged edition (2005)

(5) Traffic Theory, Berkeley, CA (C.F. Daganzo, editor), American Elsevier, New York, N.Y. (1993).

**期刊:**

(1) “Adaptive offsets for signalized streets” Transportation Research Part B 117, 926-934 (2018)

(2) “The effect of crosswalks on traffic flow”. European Journal of Transport and Infrastructure Research, 18(2), 145-157 (2018). (w/ Knoop, V. L.)

(3) “How network structure can boost and shape the demand for bus transit” Transportation Research Part A 103, 83–94 (2017) (w/ Badia, H. and Argote-Cabanero, J.A.)

(4) “Traffic flow on signalized streets”, Transportation Research Part B 90, 56-59 (2016). (w/ Lehe, L.J.).

(5) “Traffic flow on pedestrianized streets”, Transportation Research Part B 86, 211-222 (2016). (w/ Knoop, V.L.)

(6) “Dynamic Control of Complex Transit Systems” Transportation Research Part B 81, 146-160 (2015). (w/ Argote-Cabanero, J., and Lynn, J.)

## 2. Susan Shaheen

苏珊 沙欣

加州大学伯克利分校教授

交通可持续发展研究中心主任

院系:Energy, Civil Infrastructure and Climate

-Transportation Engineering



### 1.1 简介

Shaheen 是国际上享有盛誉的交通和共享经济专家。2003 年至 2007 年，担任加州先进交通和高速公路合作伙伴的政策和行为研究项目负责人，现任交通可持续发展研究中心主管。Shaheen 关于汽车共享、智能停车和老年交通的研究项目获得了国家奖项，交通研究委员会颁发的 2017 年 Roy W. Crum 奖，以表彰她在交通研究方面的杰出成就。2016 年被埃诺交通基金会评为交通领域十大学术思想领袖之一。

Shaheen 在校外还担任《运输政策》的编辑；《运输研究记录》的副编辑；是《运输研究》A 部分（2020 年至今）、《国际可持续运输杂志》（2011 年至今）和《运输政策案例研究》（2018 年至今）的编辑委员会成员；同时担任交通研究委员会（TRB）执行委员会的主席（2021 年 1 月至今）；《国际交通科学与技术杂志》的编委（2015 年至 2019 年）；美国交通部部长的 ITS 项目咨询委员会成员（2014 年至 2018 年）。

### 1.2 近期研究方向/活动

Shaheen 近期研究重点是未来交通与共享交通，这与她带领的交通可持续发展研究中心（Transportation Sustainability Research Center, TSRC）重合度较高。这

TSRC 中心是由加州大学交通中心、加州大学能源研究所、交通研究所、能源和资源小组、全球都市研究中心和伯克利环境研究所组合成立的。交通可持续发展研究中心使用广泛的分析和评估工具，包括问卷调查、访谈、焦点小组、自动数据收集系统和模拟模型来收集数据并对数据进行分析 and 解释。中心针对政策制定者感兴趣的关键问题提出公正的结论和建议，以帮助决策：TSRC 已经协助

制定和实施了加州和联邦有关可持续交通的主要法规和倡议,其中包括加州全球变暖解决方案法案(AB 32)、低排放车辆计划和零排放车辆任务、帕夫利法、低碳燃料标准政策、加州 SB 375(反扩张立法)以及 2007 年联邦能源独立和安全法案。

中心研究领域如下:

- ▶ 先进车辆和燃料 Advanced Vehicles & Fuels
- ▶ 能源和基础设施 Energy & Infrastructure
- ▶ 未来交通 Future of Mobility
- ▶ 货物运输 Goods Movement
- ▶ 特殊群体的交通 Mobility for Special Populations
- ▶ 共享交通 Shared Mobility

### 1.3 代表出版物/文章:

#### 书籍:

(1) Shared Mobility and Automated Vehicles: Responding to socio-technical changes and pandemics. The Institution of Engineering and Technology (2022) . ISBN:9781785618628

(2) Disrupting Mobility: Impacts of Sharing Economy and Innovative Transportation on Cities. Cham, Switzerland: Springer (2017) . ISBN: 3319516019.

#### 期刊:

(1) Wong, S., J. Walker, and S. Shaheen (2020). "Bridging the Gap Between Evacuations and the Sharing Economy," *Transportation*, 50 pages. DOI: 10.1007/s11116-020-10101-3.

(2) Wong, S., C. Chorus, S. Shaheen, and J. Walker (2020). "A Revealed Preference Methodology to Evaluate Regret Minimization with Challenging Choice Sets: A Wildfire Evacuation Case Study." *Travel Behaviour and Society*. Volume 20, 331-347.

(3) Bauer, G., C. Zheng, J. B. Greenblatt, S. Shaheen, D. Kammen (2020). "On-Demand Automotive Fleet Electrification Can Catalyze Global Transportation Decarbonization and Smart Urban Mobility," *Environmental Science & Technology*. DOI: 10.1021/acs.est.0c01609, 7 pages.

(4) Sadek, B., E. Martin, and S. Shaheen (2020). “Online Truck Parking Forecasting Using Fourier Transformations,” *Journal of Transportation Engineering. Part A: Systems. Part A: Systems*, 146(8), paper: 05020006. DOI: 10.1061/JTEPBS.0000397.

(5) Wong, S., J. Broader, and S. Shaheen (2020). “Can Sharing Economy Platforms Increase Social Equity Impacts for Vulnerable Populations in Disaster Response and Relief? A Case Study of the 2017 and 2018 California Wildfires.” *Transportation Research Interdisciplinary Perspectives (TRIP)* 5 (2020), paper: 100131. DOI: 10.1016/j.trip.2020.100131

(6) Wong, S. D., J. L. Walker, and S. A. Shaheen (2020). “Trust and Compassion in Willingness to Share Mobility and Sheltering Resources in Evacuations: A Case Study of the 2017 and 2018 California Wildfires,” *International Journal of Disaster Risk Reduction*. 19 pages. DOI:10.1016/j.ijdr.2020.101900.

### 3. Serge Hoogendoorn

(S.P. Hoogendoorn)

塞尔吉·霍根多恩

代尔夫特理工大学首席教授

院系: Department of Transport & Planning

Civil Engineering and Geosciences



#### 1.1 简介

Hoogendoorn 长期致力于交通流理论、交通网络建模、动态交通分配、出行行为分析等领域的研究，是交通流和交通网络分析方面的专家，在 *Journal of ITS*、*Network Management Magazine*、*Transportation Research Part B* 等众多国际知名期刊担任副主编和编委等职务。

自 2018 年以来一直担任交通与规划系主任。他是代尔夫特理工大学智能城市交通的（四个之一）特聘教授，交通运输与规划系交通管理方向的首席教授，同时在莫纳什大学兼职，也是中国东南大学交通学院的荣誉教授。他是 RIOH（北京）的杰出研究人

员，高级城市解决方案研究所（[www.ams-amsterdam.com](http://www.ams-amsterdam.com)）的移动性 PI，也是 DUT 运输和物流 TRAIL 研究学院的工作人员（[www.rstrail.nl](http://www.rstrail.nl)），他还是网络管理基金会的主席（[www.nm-magazine.nl](http://www.nm-magazine.nl)）。

Hoogendoorn 是极少数在荷兰 NWO Vernieuwingspuls 计划的所有组成部分（VENI、VIDI 和 VICI，NWO 是荷兰国家科学基金会）获得个人资助的学者之一。2014 年，他因其关于主动模式机动的 ALLEGRO 项目获得了著名的 ERC 高级赠款（290 万欧元）。除此之外，他还获得了许多主要来自荷兰国家科学基金会的科学资助。

#### 1.2 近期研究方向/活动

(1) Serge Hoogendoorn 目前的研究围绕智能城市交通展开，重点领域包括：

① 交通和运输网络的理论、建模和模拟，包括汽车、行人、自行车和新的公共交通服务（例如，与传统公共交通相结合的需求响应式交通）；

② 开发交通和运输网络的综合管理方法（区域网络管理、人群和自行车管理；

公共交通运营)；

③出行行为和网络运营的不确定性影响。

④开发这些网络的综合管理方法(区域网络管理、人群和自行车管理；公共交通运营)；⑤旅行行为和网络运营的不确定性的影响；

⑥信息和通信技术(ICT)对网络流量运营、稳健性和弹性的影响，

⑦城市数据及其应用。

(2) 近期动态：《校园交通仪表盘监控代尔夫特大学的人群行为》

Campus Mobility Dashboard to monitor crowd behavior at TU Delft

(可参见

<https://www.tudelft.nl/en/ceg/research/stories-of-science/campus-mobility-dashboard-to-monitor-crowd-behavior-at-tu-delft>)

### 1.3 部分论文：

书籍：

(1) Traffic Simulation and Data: Validation Methods and Applications, CRC Press (2014), ISBN: 1138075914

(2) Traffic and Granular Flow '03, Springer-Verlag Berlin Heidelberg (2005), ISBN: 9783540258148

论文：

(1) Access denied? Digital inequality in transport services  
Durand, A., Zijlstra, T., van Oort, N., Hoogendoorn-Lanser, S. & Hoogendoorn, S., 2021, In: Transport Reviews. p. 1-26 26 p.

(2) Data collection methods for studying pedestrian behaviour: A systematic review  
Feng, Y., Duives, D., Daamen, W. & Hoogendoorn, S., 2021, In: Building and Environment. 187, p. 1-25 25 p., 107329.

(3) Adaptations in driver behaviour characteristics during control transitions from full-range Adaptive Cruise Control to manual driving: an on-road study  
Varotto, S. F., Farah, H., Bogenberger, K., van Arem, B. & Hoogendoorn, S. P., 2020, In: Transportmetrica A: Transport Science. 16, 3, p. 776-806 31 p.

(4) Bike-sharing systems' impact on modal shift: A case study in Delft, the Netherlands  
Ma, X., Yuan, Y., Van Oort, N. & Hoogendoorn, S., 2020, In: Journal of Cleaner Production. 259, p. 1-13 13 p., 120846.

#### 4. Yossi Sheffi

##### 尤西 谢菲

麻省理工学院土木与环境工程系教授  
麻省理工学院运输与物流中心主任  
麻省理工学院供应链管理项目主任  
数据、系统和社会研究所教授



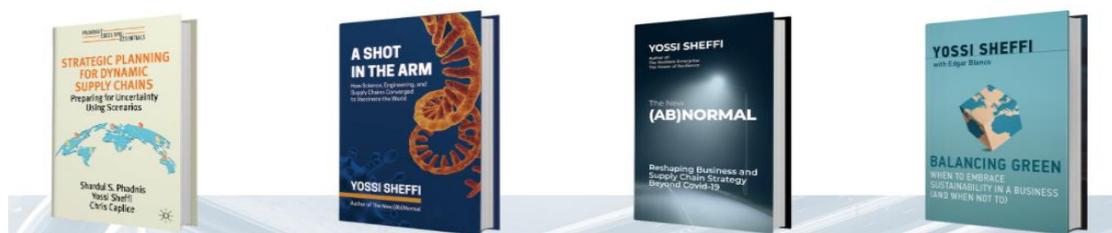
##### 1.1 简介

Yossi Sheffi 在麻省理工学院教授和研究的课题集中在系统优化、风险分析和供应链管理方面。他致力于麻省理工学院 CTL 的国际推广，启动了供应链和物流卓越（SCALE）的全球教育和研究学术中心网络（该网络包括在西班牙萨拉戈萨、卢森堡、哥伦比亚波哥大、马来西亚吉隆坡和中国宁

波），Sheffi 博士在学术和行业论坛上得到了许多认可，包括 1997 年由供应链管理专业委员会颁发的杰出服务奖、2006 年阿拉贡国际奖。此外，他还是剑桥大学克莱尔霍尔学院的终身研究员。任教之外，Sheffi 曾为世界各地的政府和领先的制造、零售和运输企业提供咨询，也是一位活跃的企业家

##### 1.2 研究兴趣

- 运输和物流系统分析 Transportation and logistics systems analysis
- 应用于物流管理和承运人运营的网络优化决策支持系统 Decision support systems for network optimizations with application to logistics management and carrier operations
- 供应链管理 Supply chain management
- 风险管理和复原力 Risk management and resilience
- 物流集群 Logistics clusters



### 1.3 代表出版物/文章:

#### 书籍:

(1) Strategic Planning for Dynamic Supply Chains: Preparing for Uncertainty Using Scenarios (Palgrave Executive Essentials) (Palgrave Macmillan; 1st ed. 2022 edition) ISBN-13: 978-3030918125

(2) Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods (Prentice Hall, 1985) ISBN-13: 978-0139397295

(3) The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage (MIT Press, 2005)

(4) Logistics Clusters: Delivering Value and Driving Growth (MIT Press, 2012) ISBN-13 978-0262693493

(5) Balancing Green: When to Embrace Sustainability in a Business (and When Not To) (MIT Press, 2018) ISBN-13: 978-0262037723

(6) A Shot in the Arm: How Science, Engineering, and Supply Chains Converged to Vaccinate the World (CTL Media, 2021). ISBN-13: 979-8985070507

#### 文章:

(1) Phadnis, S., Sheffi, Y., Caplice, C., Singh, M., Strategic Cognition of Operations Executives. PRODUCTION AND OPERATIONS MANAGEMENT. Vol. 26, No. 12, December 2017.

(2) Perez-Franco, R., Phadnis, S., Caplice, C., and Sheffi, Y., Rethinking Supply Chain Strategy as a Conceptual System, INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS, 182:384-396, December 2016.

(3) Sheffi, Y., Mitigating the High Risk of Low-Cost Items, INSIDE SUPPLY MANAGEMENT MAGAZINE, 27(6):28-31, August 2016.

(4) Phadnis, S., Caplice, C., and Sheffi, Y., How Scenario Planning Influences Strategic Decisions, MIT SLOAN MANAGEMENT REVIEW, 57(4):24-27, Summer 2016.

## 5. Jinhua Zhao

### 赵锦华

麻省理工学院副教授

麻省理工学院交通研究与教育中心总负责人

城市出行实验室 (MIT Urban Mobility Lab) 主任

公共交通实验室 (Transit Lab at MIT) 主任



### 1.1 简介

赵锦华是美国麻省理工学院 (MIT) 城市与交通规划系 (Transportation and City Planning) 副教授。他致力于与全球主要交通当局和运营商的长期研究合作, 包括伦敦、芝加哥、香港和新加坡。他是麻省理工学院能源倡议的交通系统中心的联合主任, 也是麻省理工学院交通倡议 (MIT Mobility Initiative) 的主任。

赵锦华将行为科学和交通技术结合起来, 塑造出行行为, 设计交通系统, 并改革城市政策。他提出感知、预测、劝导和调节旅行行为的方法, 并设计了多式联运系统, 将自动驾驶和共享交通与公共交通相结合。他认为交通是描述一个人、描述一个城市、理解一个机构的语言、建立交通系统和政策的行为基础。

赵锦华所带领的麻省理工学院城市交通实验室研究关注点:

#### (1) 城市交通的行为基础 Behavioral Foundation of Urban Mobility

- 出行情感 Emotional Travel
- 重新诠释时间 Reinterpreting Time
- 移动性感知和预测 Mobility Sensing and Prediction

#### (2) 交通系统: 基于行为学的角度的设计 Mobility System: Design with Behavioral Perspective

- 管理自动驾驶汽车 Governing Autonomous Vehicles
- 社会交通共享系统 Social Mobility Sharing System
- 推动可持续出行 Nudging Sustainable Travel

#### (3) 交通政策: 制定、实施和评估 Mobility Policy: Formulate, Implement and Evaluate

- 政策的公平性、接受度和合规性 Policy Equity, Acceptance and Compliance
- 可及性、生产力和集聚性 Accessibility, Productivity, and Agglomeration
- 中国的城市化和机动化 China's Urbanization and Motorization

## 1.2 在研项目及文章

### (1) 恢复波士顿都市圈的交通乘客量

该项目旨在探寻由于 COVID-19 导致的公交乘客量的下降问题，并寻找对恢复大波士顿地区乘客量最有效的干预措施。例如通过对乘客态度的纵向调查；对交通出行数据的分析；以及对交通系统最佳实践和创新的全球扫描。

### (2) 利用交通数据进行行为洞察

JTL-交通实验室已经与世界各地的领先交通机构合作，从交通智能卡和其他自动数据收集系统中获得对乘客行为的独特见解。例如，他们与伦敦交通局合作，将每日 2000 万张票卡记录转化为行为集群，从而为交通网络的运营和设计提供信息。这种聚类方法已经通过长期的研究合作应用于其他交通机构。该项目创新研究的另一个例子是利用目的地推理算法的结果为未来需求的预测提供信息。

该项目目前发表的文章：

① Inferring Passenger Responses to Urban Rail Disruptions Using Smart Card Data: A Probabilistic Framework, Baichuan Mo, Haris N. Koutsopoulos, and Jinhua Zhao , Transportation Research Part E, (2022)

② Discovering Latent Activity Patterns from Transit Smart Card Data: A Spatiotemporal Topic Model, Zhan Zhao, Haris Koutsopoulos, and Jinhua Zhao , Transportation Research Part C, (2020)

③ Dynamic Origin-Destination Prediction in Urban Rail Systems: A Multi-resolution Spatio-Temporal Deep Learning Approach, Peyman Noursalehi, Haris N. Koutsopoulos, and Jinhua Zhao , IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, (2020)

④ Demand Management of Congested Public Transport Systems: A Conceptual Framework and Application Using Smart Card Data, Anne Halvorsen, Haris

Koutsopoulos, Zhenliang Ma, and Jinhua Zhao , Transportation, (2019)

### (3) 公共交通管理和政策

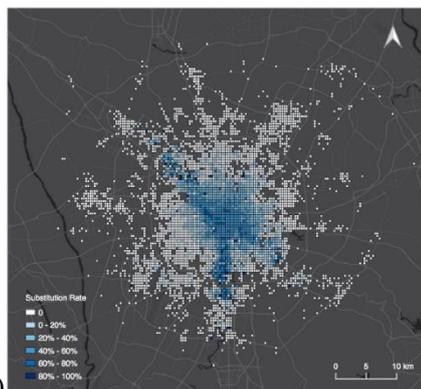
一个强大的公共交通网络是城市交通系统的一个组成部分。JTL-Transit 联合实验室将行为科学和系统工程结合起来，以确定如何改善公共交通的乘客流量，更好地了解需求，并为交通机构提供政策解决方案，帮助他们应对这一领域的新的挑战。

该项目目前发表的文章：

① How does Ridesourcing Substitute for Public Transit? A geospatial perspective in Chengdu, China, Hui Kong, Xiaohu Zhang, and Jinhua Zhao , Journal of Transport Geography, (2020)

② Modeling Epidemic Spreading through Public Transit using Time-Varying Encounter Network, Baichuan Mo, Feng Kairui, Yu Shen, Tam Clarence, Li Daqing, Yin Yafeng, and Jinhua Zhao , Transportation Research Part C, (2020)

③ Worse than Baumol's disease: The implications of labor productivity, contracting out, and unionization on transit operation costs, Javier Morales-Sarriera, Frederick Salvucci, and Jinhua Zhao , Transport Policy, 10/2017, Volume 61, p.10-16,

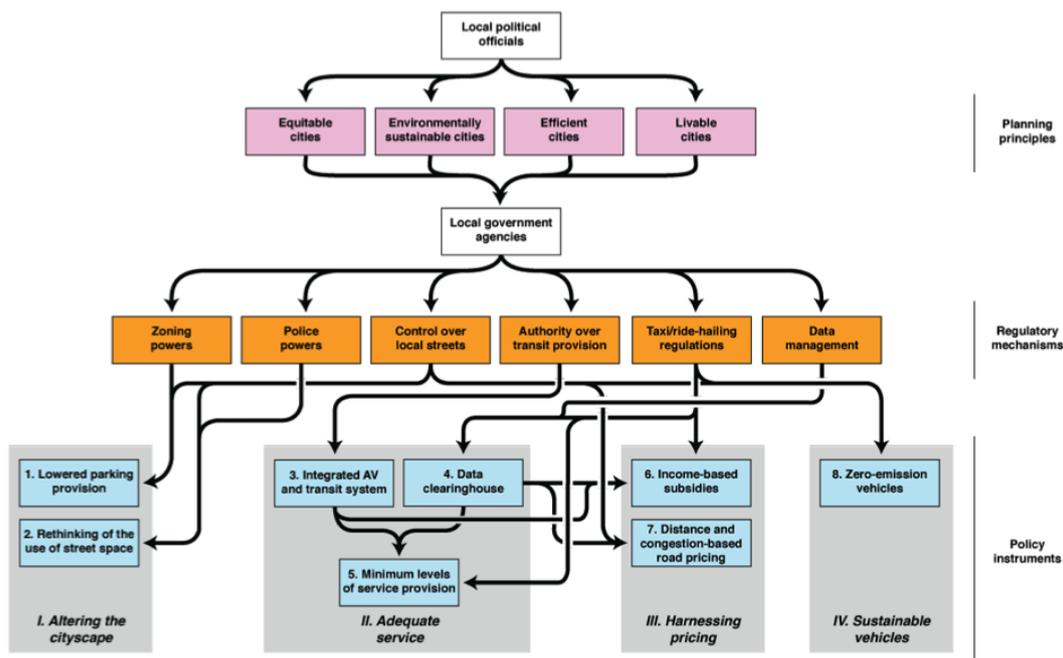


(2017)

### (4) 自动交通 (Autonomous Mobility)

自动驾驶汽车 (AV) 技术的出现，有望颠覆城市交通和交通政策。然而，这项技术，以及它可能带来的社会和环境后果，还远未确定。在 JTL 通过研究人们对自动驾驶汽车偏好的形成过程，来研究人、政策和城市景观将如何与这项新技术互动；评估如何通过信息、价格、运营和机构的整合，在公共交通系统中

嵌入共享的自动驾驶汽车服务。设想市政府如何制定自动驾驶汽车政策，以产生更公平、可持续、高效和宜居的城市；研究自动驾驶汽车对城市系统的潜在次要影响，包括土地利用和环境，以及减轻负面影响的政策；正视自动驾驶汽车规划中固有的不确定性，并应用适合这种不确定性的研究方法。



该项目目前发表的文章：

Φ Policies for autonomy: How American cities envision regulating automated vehicles, Yonah Freemark, Anne Hudson, and Jinhua Zhao , Urban Science, (2020)

Ⓚ Deep Neural Networks for Choice Analysis: Extracting Complete Economic Information for Interpretation, Shenhao Wang, Qingyi Wang, and Jinhua Zhao , Transportation Research Part C: Emerging Technologies, (2020)

## 6. Tarek Sayed

### 塔瑞克 赛义德

英属哥伦比亚大学教授

加拿大工程院院士

院系: Department of Civil Engineering

《加拿大土木工程学报》编委



### 1.1 简介

Sayed 博士是加拿大工程学院、加拿大工程研究所、加拿大土木工程学会的研究员，是《加拿大土木工程杂志》的编辑，也是 UBC 智能运输系统和货运安全局（BITSAFS 工程）的局长。曾担任加拿大土木工程学会交通和计算机应用部门的主席。

Sayed 撰写或合著了约 250 篇期刊/会议论文，并为交通工程师学会（ITE）、不列颠哥伦比亚省保险公司（ICBC）、不列颠哥伦比亚省交通部（BCMOT）、阿什加爾（卡塔尔）指导和组织了许多交通安全、运营和 ITS 方面的短期课程和研讨会。Sayed 还在多个国家和国际委员会任职，包括美国交通研究委员会安全数据和分析委员会、美国交通研究委员会道路安全未来方向小组委员会、美国交通研究委员会行人委员会和加拿大国家道路安全委员会。

### 1.2 近期研究方向/活动

Sayed 改进交通安全分析和评估方法的研究，有助于重塑道路安全问题的识别和评估方式。所开发的方法和技术得到了广泛的认可，并被不列颠哥伦比亚省保险公司（ICBC）、美国国家农场保险公司、美国 AAA 密歇根州和美国联邦公路管理局（FHWA）采用；Sayed 提出一种评估框架被 BCMOT 采用；该框架来评估位于不列颠哥伦比亚省南部温哥华和惠斯勒之间的海天公路的新设计。在智能交通系统和交通运营领域，Sayed 为开发公交信号优先的综合战略所做的研究已成功应用于温哥华的两条走廊，还帮助建立了一个省级 ITS 愿景和战略计划，利用先进技术帮助解决省级、区域和地方的交通问题。

Sayed 获奖众多，如 ITE Wilbur Smith 杰出交通教育家奖；加拿大土木工程学会 Sandford Fleming 奖；加拿大交通协会学术优异奖等。

**(1) 研究领域:**

- 改进道路安全分析和评估技术
- 提高与交通运营和公路设计的安全影响相关的知识水平
- 开发和评估智能交通系统 (ITS), 以提高交通效率

**(2) 研究兴趣:**

- 全贝叶斯安全模型 Full Bayes safety models
- 交通冲突技术 Traffic conflicts techniques
- 使用计算机视觉技术的自动安全分析 Automated safety analysis using computer vision techniques
- 行人建模 Pedestrian modeling

**(3) 在研项目:**

微观行人步行行为研究

Investigation of microscopic pedestrian walking behavior

**1.3 代表出版物/文章:**

**书籍:**

Efficient Transportation and Pavement Systems: Characterization, Mechanisms, Simulation, and Modeling, CRC Press (2008), ISBN: 9780415489799

**期刊:**

(1) M. H. Hussein, Sayed, T., Ismail, K., and Espen, V., "Calibrating Road Design Guides Using Risk-Based Reliability Analysis: A Case Study", Journal of Transportation Engineering, ASCE, In Press.

(2) Y. Guo, Sayed, T., and Zaki, M., "Examining Two-wheelers' Overtaking Behavior and Lateral Distance Choices at a Shared Roadway Facility in China", Journal of Transportation Safety and Security, In Press.

(3) C. Llorca, Moreno, A., Sayed, T., and Garcia, A., "Risk Evaluation Of Passing Sight Distance Standards Based On Observational Data", Transportation Research Record: Journal of the Transportation Research Board, In Press.

(4) A. Tageldin, Sayed, T., Zaki, M., and Azab, M., "A Safety Evaluation of an Adaptive Traffic Signal Control System using Computer Vision", Advances in Transportation Studies, In Press.

## 7. Liping Fu

付立平

滑铁卢大学教授

创新交通系统解决方案 (iTSS) 实验室主任

院系: Civil and Environmental Engineering



### 1.1 简介

Liping Fu 在智能交通系统、公共交通、道路安全和冬季道路维护等多个领域都有贡献。他曾为许多交通机构提供技术服务,包括加拿大交通部、安大略省交通部 (MTO) 和加拿大一些城市。傅教授也是许多冬季冰雪控制相关项目的主要研究者,这些项目由自然科学和工程研究委员会 (NSERC)、安大略省交通厅、安大略省景观局和盐业研究所资助。

Liping Fu 曾在多个专业组织的技术委员会任职,如运输研究委员会的委员会和运输研究杂志的编辑顾问委员会。此外,他还是加拿大土木工程协会交通部的前任主席、安大略省专业工程师协会会员、运输工程师协会准会员、加拿大城市交通协会 (CUTA) 与加拿大智能交通系统 (C-ITS) 会员。

由于出色的工作与成绩,傅教授获得了加拿大交通协会 (TAC) 的 2011 年学术成就奖,以表彰他对学术领域发展的长期贡献。

他领导的创新交通系统解决方案 (iTSS) 实验室创造了一些与交通有关的产品和软件。代表性的产品有 2 个:(1) 与 Frank Saccomanno 教授设计了 GradeX--一个决策支持工具,可供加拿大铁路安全工程师用于识别交叉口热点,评估对策,并确定安全改进项目的优先次序;(2) SimParatransit, 为难以进入常规公共交通系统的老年人和残疾人提供公平的交通服务。与常规的固定路线交通不同,辅助交通通常使用中小型车辆,以灵活的路线和时间表提供共同乘坐、门到门的服务。

### 1.2 近期研究方向/活动

#### (1) 研究兴趣

- ▶ 冬季养护作业 Winter Maintenance Operations

- 公路安全与风险分析 Highway Safety and Risk Analysis
- 实时信息下的交通和公交运营控制 Traffic and Transit Operations Control under Real-time Information
- 动态和随机交通网络中的车辆路由和调度 Vehicle Routing and Scheduling in Dynamic and Stochastic Traffic Networks
- 实时信息下的自适应信号控制 Adaptive Signal Control under Real-time Information
- 为拨号乘车辅助系统开发在线和离线路由和调度系统 Development of On-line and Off-line Routing and Scheduling Systems for Dial-A-Ride Paratransit Systems
- 智能辅助交通系统的规划和评估 Planning and Evaluation of Intelligent Paratransit Systems.
- 动态和随机交通网络中旅行时间的估计 Estimation of Travel Times in Dynamic and Stochastic Traffic Network
- 智能交通系统应用的最短路径算法 Shortest Path Algorithms for ITS Applications

## (2) 在研项目

### ① 创新交通研究的虚拟交通实验室 VIRTUAL MOBILITY LAB FOR INNOVATIVE TRANSPORTATION RESEARCH

该项目旨在建立一个新的虚拟交通实验室（VML），拥有一套最先进的、多模式的行人、自行车和驾驶模拟器、交通数据收集装置和支持性的计算平台。该实验室将与我们的外部合作伙伴的云门户相连接，以便离线和在线访问来自滑铁卢地区（ROW）300 多个交叉口的数百个 Miovision 和第三方交通传感器（如相机、环路、蓝牙/无线探测器）的大数据（行人、自行车和机动车交通流）。除了所需的 VR 模拟软件系统，VML 还将配备最先进的交通系统建模和模拟软件，如 INRO EMME（一个多式联运需求分析系统）、PTV Vissim（一个微观的多模式交通流模拟器）和 Trafficware Synchro（一个宏观的交通分析和信号优化工具）

## **2 利用蓝牙/WIFI 和联网车辆数据推进交通管理 (NSERC ALLIANCE +OCE-VIP ) ADVANCING TRAFFIC MANAGEMENT USING BLUETOOTH/WIFI AND CONNECTED VEHICLE DATA (NSERC ALLIANCE + OCE-VIP)**

本研究是滑铁卢大学和 SMATS 之间的合作,旨在利用蓝牙/无线和 CV 数据开发新的交通性能测量和信号控制系统。具体来说,研究将实现以下目标:开发新的指标,以评估不同时空尺度的道路交通性能;开发新的基于人工智能的交通信号控制方法,以利用新的大交通数据源;探索基于模拟的创新技术,以评估性能指标和控制模型的有效性。研究将解决两个截然不同的数据源:高频率但低质量的蓝牙/Wifi 数据与低频率但高质量的 CV 数据所带来的挑战。它将产生新的知识、创新的交通分析和信号控制方法,以及新的模型和工具,可以立即在现场测试和实施,使安大略省和加拿大所有城市受益。

## **3改善铁路安全合作研究(加拿大交通部) COLLABORATIVE RESEARCH FOR IMPROVED RAIL SAFETY (TRANSPORT CANADA)**

这是一个由阿尔伯塔大学、麦吉尔大学和约克大学参与的合作研究项目,由加拿大交通部资助。该计划包括五个项目,旨在解决与铁路运输有关的广泛问题。

- 铁路道口 (railway crossings) 安全管理--开发和完善加拿大交通部的风险评估和对策分析工具--GradeX;
- 火车脱轨的风险评估和因果关系分析
- 利用视频技术和机器学习进行实时安全监测和冲突分析
- 用于提升平交道口 (grade crossings) 用户警告的车联网技术
- 用于改善铁路网所存数据更新和共享的移动数据采集系统

## **4利用人工智能和智慧城市数据推进道路安全的“零愿景” ADVANCING VISION ZERO ROAD SAFETY WITH OPERATIONAL AI AND SMART CITY DATA**

这是一个与基奇纳市和滑铁卢市、皮尔区以及 Miovision 公司的联合项目,旨在解决在制定和实施“零愿景”计划中出现的问题。该项目包括三个部分(1)

开发一个框架，用于评估替代性对策和风险管理战略的成本效益（2）利用智能城市数据、安全的替代措施和人工智能开发下一代网络筛选模型，以及（3）开发模拟辅助的道路安全评估技术。

这项研究将产生新的知识，创新的安全分析方法，以及新的模型和工具，可以使加拿大所有有兴趣实施 "零愿景 "或任何类型道路安全改善计划的城市受益。该研究预计将直接加强合作城市正在制定的 "零愿景 "计划。

### 1.3 代表出版物/文章

#### 书籍:

(1) Sustainable winter road operations, John Wiley & Sons (2018) ISBN 13:9781119185154

(2) Miranda-Moreno, L. F. & Fu, L. . Chapter 2: Traffic Safety Study: Empirical Bayes or Hierarchical Bayes. Transportation Statistics // edited by B. W. Sloboda, J. Ross Publishing, 2009

#### 期刊:

(1) Muresan M , Pan G , Fu L . Multi-Intersection Control with Deep Reinforcement Learning and Ring-and-Barrier Controllers (2020) . Transportation Research Record Journal of the Transportation Research Board.

(2) Fu, L., Thakali, L., Kwon, T.J., & Usman, T. (2016). Winter Road Condition Classification and Reporting – A Risk Based Approach. Canadian Journal of Civil Engineers.

(3) Pan, G., Fu, L., Thakali, L. (2017). Development of a global road safety performance function using deep neural networks. International Journal of Transportation Science & Technology, 6(3):159-173.

(4) Heydari, S., Fu, L., Miranda-Moreno, L.F., Joseph, L. (2017). Using a flexible multivariate latent class approach to model correlated outcomes: A joint analysis of pedestrian and cyclist injuries. Analytic Methods in Accident Research, 13, 16-27.

(5) Heydari, S., Fu, L., Joseph, L., Miranda-Moreno-L.F. (2016). Bayesian nonparametric modeling in transportation safety studies: Applications in univariate and multivariate settings. Analytic Methods in Accident Research, 12, 18-34.

## 8. Yinhai Wang

### 王印海

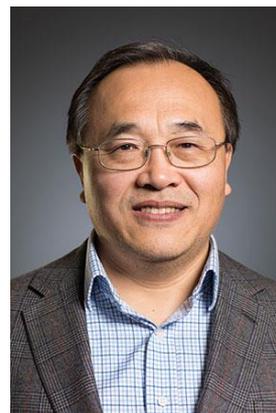
华盛顿大学（西雅图）土木和环境工程系终身教授

华盛顿大学智能交通应用与研究实验室主任

太平洋西北交通联盟（PacTrans）的主任

美国联邦交通部第 10 区大学交通研究中心主任

院系：Civil & Environmental Engineering



#### 1.1 简介

Yinhai Wang 先后主持或参与主持了 72 项由美国环境保护署、联邦交通部等部门资助的科研项目，其中一项资助强度高达 3000 万美元。在国际学术期刊及会议上发表论文 150 多篇（其中，100 多篇论文被 SCI 收录），并获得美国土木工程学会（ASCE）交通工程期刊 2003 年度最佳论文奖。应邀在中国、美国、日本、欧洲等国家和地区的学术机构、政府及专项研讨会讲学 197 次。在国际会议上发表演讲 197 次，并获日本土木工程学会第 51 届年

会最佳讲演奖。

现任美国联邦交通部第 10 区（由西北地区四州构成）大学交通研究中心主任，电气与电子工程师协会（IEEE）智慧城市创意指导委员会委员，第一届 IEEE 智慧城市国际会议主席。曾任 IEEE 智能交通系统分会理事（2010-2013 年）、美国土木工程师协会（ASCE）交通与发展委员会（T&DI）理事（2013-2015 年）。现任美国科学院交通研究会（TRB）两个专业委员会委员，3 个 SCI 收录期刊的副主编。

#### 1.2 近期研究方向/活动

##### （1）研究方向

- 交通检测系统 Traffic Detection Systems
- 交通大数据分析 Transportation Bigdata Analytics
- e 交通科学 E-science of Transportation
- 交通运营与模拟 Traffic Operations and Simulation
- 联网/自动驾驶车辆的影响 Connected/automated Vehicle Impacts
- 智能城市交通 Smart Urban Mobility

## (2) 团队研究方向

Yinhai Wang 领导的 STAR (Smart Transportation Applications & Research) 实验室为智能交通系统 (ITS) 的理论和应用进行调查、评估、模拟、原型设计和开发, 研究主题为:

- ① 交通传感和边缘计算
- ② 交通数据科学和分析
- ③ 智能基础设施和未来城市流动性
- ④ 交通运营和安全

### 1.3 代表出版物/文章

#### 书籍

Data-driven Solutions to Transportation Problems, Elsevier Science Publishing Co Inc. (2018). ISBN:9780128170267.

#### 会议集:

- (1) ICCTP 2011: Mobility, Safety, Efficiency, and Sustainability in Transportation System Development. American Society of Civil Engineers. 2011.
- (2) ICCTP 2010: Integrated Transportation Systems: Green • Intelligent • Reliable. American Society of Civil Engineers. 2010.
- (3) ICCTP 2009: Critical Issues in Transportation System Planning, Development, and Management. American Society of Civil Engineers. 2009.

#### 文章:

- (1) Wu, Yao-Jan, Guohui Zhang, and Yinhai Wang. "Link Journey Speed Estimation for Urban Arterial Performance Measurement using Advance Loop Detector Data under Congested Conditions." Journal of Transportation Engineering. In Press. Aug. 2011.
- (2) Lao, Yunteng, Guohui Zhang, Yao-Jan Wu, and Yinhai Wang. "Modeling Animal-Vehicle Collisions Considering Animal-Vehicle Interactions." Accident Analysis and Prevention. Issue 43, 1991-1998, 2011.
- (3) Lao, Yunteng, Yao-Jan Wu, Yinhai Wang, and Xiaoguang Yang. "Applicability of Single and Double Phase Midblock Crossings." Proceedings of the ICE: Transport. In Press. 2011.

## 9. Megan Ryerson

### 梅根 瑞尔森

宾夕法尼亚大学副教授

UPS 交通系主任

宾夕法尼亚大学交通安全中心 (Center for Safe Mobility) 主任

院系: Department of City & Regional Planning,  
Department of Electrical & Systems Engineering



### 1.1 简介

Ryerson 是宾夕法尼亚大学年轻有为的学者，同时担任宾夕法尼亚州交通部航空咨询委员会成员、宾夕法尼亚州交通部州交通创新委员会、伊诺交通中心顾问委员会成员，还被美国交通部长和宾夕法尼亚州州长任命为航空相关咨询委员会成员。

Ryerson 研究聚焦在交通基础设施规划和需求预测领域。她的工作研究了机场如何在特大区域竞争航空服务，航空公司如何重新配置其灾害规划以达到更有弹性的结果，以及如何更积极地规划航班以减少燃料消耗，支持安全、高效和有弹性的运输系统

的设计。Ryerson 还扩大了城市规划的教学范围，将与特大区域与城际交通 (Megaregional and intercity transportation) 更直接地纳入城市和区域规划。

Ryerson 荣获 2019 年美国联邦航空管理局 RAISE 奖 (表彰航空和航天科学与工程创新)，2016 年 Fred Burggraf 交通运输研究最佳论文奖 (年轻学者组)，被华盛顿非营利智囊机构伊诺交通中心 (Eno Center for Transportation) 评为十大交通思想领袖。

### 1.2 近期研究方向/活动

#### (1) 交通网络恢复能力 (Transportation Network Resilience) 的计划和算法

这一研究领域旨在确定航空公司网络结构的变化如何使航空系统更容易受到机场停航的影响。调查考虑了航空系统的不可预测性如何鼓励航空公司低效率

地运营航班，加速了导致这些停运的气候变化。研究目标包括在停机期间保持航空网络的运行，并为航空复原计划开发分析性的再利用算法。

### (2) 多式联运规划 **Multimodal Transportation Planning**

针对面向多式联运的、特大区域的方法，研究重点是铁路和未来车辆技术对短途航空运输需求的影响。项目还考虑航空运输的替代方式如何鼓励航空公司减少低效的短途航班的供应。

### (3) 航空运输的经济发展与环境规划

这项研究揭示了机场所产生的区域经济的不确定性和背景性，以及机场所产生的重大环境影响。目前，经济发展、市政资金投入航空公司补贴项目并为机场扩建提供资金，促使城市扩大航空运输供应，却还缺少配套的严格评估政策和模式选择。

### (4) 利用骑车人和行人的眼睛跟踪数据(**Eye-Tracking Data**)开发新的交通安全指标



YONG KIM/The Philadelphia Inquirer/TNS 志愿者 Cameron Adamez 戴着 Tobii Pro 的眼动追踪眼镜

宾夕法尼亚州安全交通中心通过开发眼睛追踪数据，用主动的、基于用户的指标来衡量交通安全，在理解和评估道路安全方面开发了新的交通安全指标。目前普遍使用计算车祸或死亡数据进行统计分析，这种方法存在着根本性的问题：撞车数据被严重低估，并依赖于警方和医疗报告，而且撞车计数并不包括近似事故，许多没有导致撞车的不安全互动。因此，用车祸来衡量安全是一种有偏见的方法，但目前还没有一种机制来测试行人和骑车人的安全，以利于城市交通基础设施的建设。安全交通中心通过使用眼球追踪技术来研究一个人如何与他们的环境互动，使用传感器来监测眼球运动，这些传感器收集一个人在任何特定时间的确切位置的数据，每秒钟收集 100 个数据点。通过结合对瞳孔位置、注视方向的

测量, 以及陀螺仪和加速计对头部运动、角度和速度的测量, 这些数据点形成了评估基础设施设计和安全性的新指标。这包括旨在确定最紧张的地点与经历, 最有效的干预设计分析, 以及更好地了解骑自行车的人在街道上导航的认知和视觉体验。

利用 Eye-Tracking 技术的研究还包括一个为老年人和残疾人设计的 SEPTA (Southeastern Pennsylvania Transportation Authority) 车站项目。团队与 SEPTA 合作, 使用眼球追踪技术与调查和访谈相结合, 捕捉 SEPTA 不同乘客的真实用户体验, 重点是为最弱势的老年人、残疾人用户服务, 提供改善客户体验的导向设计建议。

### 1.3 代表出版物/文章

#### 期刊

(1) Factors influencing the choice of shared bicycles and shared electric bikes in Beijing AA Campbell, CR Cherry, MS Ryerson, X Yang Transportation research part C: emerging technologies 67, 399-414 311 2016

(2) Capturing the impact of fuel price on jet aircraft operating costs with Leontief technology and econometric models MS Ryerson, M Hansen Transportation Research Part C: Emerging Technologies 33, 282-296 77 2013

(3) The potential of turboprops for reducing aviation fuel consumption MS Ryerson, M Hansen Transportation Research Part D: Transport and Environment 15 (6), 305-314 68 2010

(4) Time to burn: Flight delay, terminal efficiency, and fuel consumption in the National Airspace System MS Ryerson, M Hansen, J Bonn Transportation Research Part A: Policy and Practice 69, 286-298 59 2014

(5) Integrating airline operational practices into passenger airline hub definition MS Ryerson, H Kim Journal of Transport Geography 31, 84-93 49 2013

## 10. Mohammed Quddus

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### 1.1 简介

Quddus 是伦敦帝国学院土木与环境工程系的智能交通系统主席，也是著名期刊 *Transportation Research Part C: Emerging Technologies* 的副编辑、TRB（美国交通研究委员会）安全数据、分析和建模委员会的成员，2022 年获得 Elsevier(Transportation Research Part C: Emerging Technologies)最佳副主编奖。Quddus 因其在交通安全、自主和互联交通、大数据分析和智能交通系统（ITS）的地图匹配方面的突破性研究而闻名国际，论文具有影响力并被高度引用，并被 ITS 行业、汽车制造商和英国国家

公路局实施。Quddus 认为未来交通的愿景越来越基于智能交通（IM）的概念，其中部分和完全自主的车辆、道路基础设施和交通管理系统的连接能力将人和货物置于交通系统的核心。新的智能技术可以在安全和移动性方面带来阶梯式的变化。因此，Quddus 教授一直与他的研究助理、博士生和来自其他学科、大学和工业界的同事在自主或半自主车辆的操作、规划和风险评估领域进行合作。Quddus 的研究项目主要由英国工程与物理科学研究委员会（EPSRC）、国家公路局、英国交通部和欧盟（EU）资助。

### 1.2 近期研究方向/活动

#### （1）研究领域：

- 运输安全和新兴技术：分析、建模和评估
- 联网和自主运输：影响、运营和规划
- 分类、建模和预测：人工智能、机器学习、深度学习和时间序列技术在高速公路运营方面的应用

## (2) 目前关注领域:

- 如何能改变现有的道路基础设施,以安全地运行、容纳由颠覆性技术支持的新的移动服务? How could we alter our existing road infrastructures to safely operate and accommodate new mobility services supported by disruptive technologies.
- 如何估计联网和自动驾驶车辆对网络级安全和拥堵的影响? How could we estimate the impacts of connected and autonomous vehicles on network-level safety and congestio
- 能否协助汽车行业开发智能传感器融合算法,从低成本的传感器获取数据,提供更好的质量输出? Could we assist automobile industry in developing intelligent sensor fusion algorithms that would take data from low-cost sensors but provide better quality outputs

## 1.3 代表出版物/文章

### 参与章节撰写的书籍:

(1) Hassan A. Karimi. Handbook of Research on Geoinformatics. **Publisher: Information Science Reference; 1st edition (December 5, 2008)**  
**ISBN-13: 978-1591409953**

(2) Azim Eskandarian . Handbook of Intelligent Vehicles. Publisher: Springer; 2012th edition (February 26, 2012) ISBN-13: 978-0857290847

(3) Dominique Lord, Simon Washington. Safe Mobility: Challenges, Methodology and Solutions. Publisher : Emerald Publishing Limited (April 18, 2018). ASIN: B06XKD4792

### 期刊:

(1) Formosa N, Quddus M, Ison S, Timmis Aet al, 2022, A new modelling approach for predicting vehicle-based safety threats, IEEE Transactions on Intelligent Transportation Systems, Pages: 1-11.

(2) Enoch M, Monsuur F, Palaiologou G, Quddus MA, Ellis-Chadwick F, Morton C, Rayner Ret al, 2022, When COVID-19 came to town: Measuring the impact of the coronavirus pandemic on footfall on six high streets in England, Environment and

Planning B: Urban Analytics and City Science, Vol: 49, Pages: 1091-1111, ISSN: 2399-8083

( 3 ) Man CK, Quddus M, Theofilatos A, 2022, Transfer learning for spatio-temporal transferability of real-time crash prediction models., *Accid Anal Prev*, Vol: 1

( 4 ) Ye M, Guan L, Quddus M, 2021, TDMP: Reliable Target Driven and Mobility Prediction based routing protocol in complex Vehicular Ad-hoc Network, *Vehicular Communications*, Vol: 31

( 5 ) Monsuur F, Enoch M, Quddus M, Meek Set al, 2021, Modelling the impact of rail delays on passenger satisfaction, *Transportation Research Part A: Policy and Practice*, Vol: 152, Pages: 19-35

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## 综合运输类学术期刊介绍

Elsevier 旗下的 Transportation Research Part 交通运输系列期刊，包括 Part A、B、C、D、E、F，每本都是优秀的期刊。**A 部分：政策与实践；B 部分：方法论；C 部分：新兴技术；D 部分：运输与环境；E 部分：物流和运输；F 部分：交通心理与行为。**整个系列是目前交通科学研究中最具凝聚力和综合性的期刊参考资料。本期为大家介绍后 3 本期刊。

### 一. 我校师生在 Transportation Research Part D、E、F 期刊上的发文情况

表 1 长安大学在 Transportation Research Part D、E、F 期刊上的发文情况

序号	Authors	Article Title	Source Title	Publication Year	Times Cited, WoS Core	Times Cited, All Databases
1	Zhao, Xuan; Zhao, Xiangmo; Yu, Qiang; Ye, Yiming; Yu, Man	Development of a representative urban driving cycle construction methodology for electric vehicles: A case study in Xi'an	TRANSPORTATION RESEARCH PART D-TRANSPORT AND ENVIRONMENT	2020	47	49
2	Li, Yi; Du, Qiang; Lu, Xinran; Wu, Jiao; Han, Xiao	Relationship between the development and CO2 emissions of transport sector in China		2019	45	46
3	Chen, Faan; Wu, Jiaorong; Chen, Xiaohong; Wang, Jianjun	Vehicle kilometers traveled reduction impacts of Transit-Oriented Development: Evidence from Shanghai City		2017	26	29

序号	Authors	Article Title	Source Title	Publication Year	Times Cited, WoS Core	Times Cited, All Databases
4	Feng, Xuesong; Zhu, Xiaojing; Qian, Xuepeng; Jie, Yuanpeng; Ma, Fei; Niu, Xuejun	A new transit network design study in consideration of transfer time composition		2019	26	26
5	Sun, Chao; Cheng, Lin; Zhu, Senlai; Han, Fei; Chu, Zhaoming	Multi-criteria user equilibrium model considering travel time, travel time reliability and distance		2019	25	26
6	Yang, Liu; Wang, Yuanqing; Han, Sunsheng; Liu, Yuanyuan	Urban transport carbon dioxide (CO <sub>2</sub> ) emissions by commuters in rapidly developing Cities: The comparative study of Beijing and Xi'an in China		2019	20	21
7	Yang, Liu; Wang, Yuanqing; Lian, Yujun; Han, Sunsheng	Factors and scenario analysis of transport carbon dioxide emissions in rapidly-developing cities		2020	14	14
8	Zhang, Weibin; Qi, Yong; Yan, Ying; Tang, Jinjun; Wang, Yinhai	A method of emission and traveller behavior analysis under multimodal traffic condition		2017	14	14
9	He, Haonan; Wang, Chao; Wang, Shanyong; Ma, Fei; Sun, Qipeng; Zhao, Xiangmo	Does environmental concern promote EV sales? Duopoly pricing analysis considering consumer heterogeneity		2021	11	13
10	Wang, Chao; Zhao, Yuelin; Wang, Yongjie; Wood, Jacob; Kim, Chi Yeol; Li, Yi	Transportation CO <sub>2</sub> emission decoupling: An assessment of the Eurasian logistics corridor		2020	11	11

序号	Authors	Article Title	Source Title	Publication Year	Times Cited, WoS Core	Times Cited, All Databases
11	Chen, Tao; Liu, Ka; Wang, Zhenyu; Deng, Gang; Chen, Bin	Vehicle forward collision warning algorithm based on road friction		2019	9	10
12	Zhang, Hong; Zhang, Chi; Hu, Tao; Zhang, Min; Ren, Xiaowei; Hou, Lei	Exploration of roadway factors and habitat quality using InVEST		2020	7	9
13	Wang, Hui; Wang, Ling; Zhang, Jiupeng; Jing, Yufei; Cao, Yuanbo	Effects of pyrolysis temperature and reaction time on the performance of swine-manure-derived bio-binder		2020	5	6
14	Zhou, Bochao; Pei, Jianzhong; Nasir, Diana Mohd; Zhang, Jiupeng	A review on solar pavement and photovoltaic/thermal (PV/T) system		2021	5	5
15	Zhang, Jingxiao; Cai, Wenyi; Philbin, Simon P.; Li, Hui; Lu, Qing-Chang; Ballesteros-Perez, Pablo; Yang, Guo-liang	Measuring the capacity utilization of China's transportation industry under environmental constraints		2020	5	5
16	Sun, Daniel (Jian); Zheng, Yijia; Duan, Ruoxin	Energy consumption simulation and economic benefit analysis for urban electric commercial-vehicles		2021	3	3
17	He, Haonan; Li, Shiqiang; Wang, Shanyong; Chen, Zhuru; Zhang, Jinxi; Zhao, Jie; Ma, Fei	Electrification decisions of traditional automakers under the dual-credit policy regime		2021	2	2

序号	Authors	Article Title	Source Title	Publication Year	Times Cited, WoS Core	Times Cited, All Databases
18	Cao, Jason; Li, Shuhan; Noland, Robert B.; Ge, Ying-En	The first 25 years of Transportation Research Part D: Transport and Environment		2021	0	0
19	Liu, Dan; Yan, Pengyu; Pu, Ziyuan; Wang, Yin Hai; Kaisar, Evangelos, I	Hybrid artificial immune algorithm for optimizing a Van-Robot E-grocery delivery system	TRANSPORTATION RESEARCH PART E-LOGISTICS AND TRANSPORTATION REVIEW	2021	1	1
20	Xiao, Yi; Wang, Grace; Ge, Ying-En; Xu, Qinyi; Li, Kevin X.	Game model for a new inspection regime of port state control under different reward and punishment conditions		2021	0	0
21	Zhang, Yuting; Yan, Xuedong; Li, Xiaomeng; Wu, Jiawei	Changes of drivers' visual performances when approaching a signalized intersection under different collision avoidance warning conditions	TRANSPORTATION RESEARCH PART F-TRAFFIC PSYCHOLOGY AND BEHAVIOUR	2019	12	13
22	Han, Wanli; Zhao, Jianyou	Driver behaviour and traffic accident involvement among professional urban bus drivers in China		2020	7	7
23	Guo, Yuxi; Sun, Qinyu; Su, Yanqi; Guo, Yingshi; Wang, Chang	Can driving condition prompt systems improve passenger comfort of intelligent vehicles? A driving simulator study		2021	1	1

## 二. Transportation Research Part 系列期刊介绍（二）

### 1. Transportation Research Part D:Transport and Environment

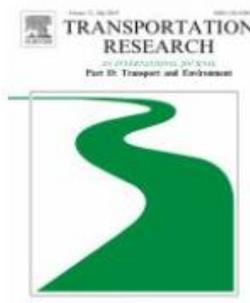


图 1 Part D 期刊封面

(1) 期刊网址:

<https://www.sciencedirect.com/journal/transportation-research-part-d-transport-and-environment>

(2) 期刊介绍: 《Transportation Research Part D:Transport and Environment》发表关于交通与环境的影响、应对这些影响的政策以及它们对交通系统的设计、规划和管理影响的研究和评论文章。它涵盖了交通与环境相互作用的各个方面,从局部到全球的影响,包括对旅行行为、空气质量、生态系统、全球气候、公共卫生、土地使用、经济发展和生活质量等的影响,包括海运、空运以及所有的地面运输方式。

(3) 出版信息:

**ISSN: 1361-9209      EISSN: 1879-2340**

Publisher information		
PUBLISHER	ADDRESS	PUBLICATION FREQUENCY
PERGAMON-ELSEVIER SCIENCE LTD	THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND	6 issues/year

图 2 Part D 期刊出版信息

(4) JCR 收录情况: 隶属于 TRANSPORTATION-SSCI、ENVIRONMENTAL STUDIES-SSCI、TRANSPORTATION SCIENCE & TECHNOLOGY - SCIE, 三个

学科，排名分别为：

CATEGORY  
TRANSPORTATION  
**6/37**

JCR YEAR	JIF RANK	JIF QUARTILE	JIF PERCENTILE
2020	6/37	Q1	85.14
2019	5/37	Q1	87.84
2018	5/36	Q1	87.50
2017	3/31	Q1	91.94
2016	11/33	Q2	68.18

CATEGORY  
ENVIRONMENTAL STUDIES  
**21/125**

JCR YEAR	JIF RANK	JIF QUARTILE	JIF PERCENTILE
2020	21/125	Q1	83.60
2019	18/123	Q1	85.77
2018	20/116	Q1	83.19
2017	21/109	Q1	81.19
2016	30/105	Q2	71.90

CATEGORY  
TRANSPORTATION SCIENCE & TECHNOLOGY  
**10/37**

JCR YEAR	JIF RANK	JIF QUARTILE	JIF PERCENTILE
2020	10/37	Q2	74.32
2019	10/36	Q2	73.61
2018	9/37	Q1	77.03
2017	7/35	Q1	81.43
2016	15/34	Q2	57.35

图 3 Part D 期刊分区情况

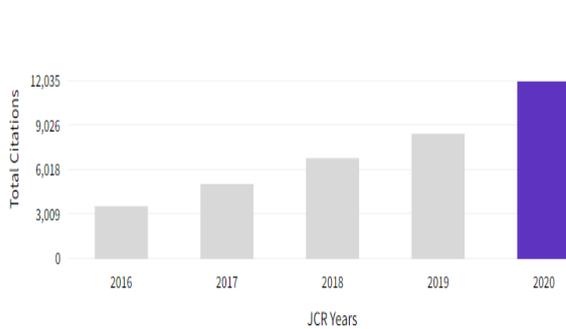


图 4 Part D 期刊总被引量趋势图



图 5 Part D 期刊隶属学科影响因子趋势图

RANK	ORGANIZATION	COUNT
1	UNIVERSITY OF CALIFORNIA SYSTEM	32
2	UNITED STATES DEPARTMENT OF ENERGY (DOE)	26
3	HELMHOLTZ ASSOCIATION	23
4	HONG KONG POLYTECHNIC UNIVERSITY	20
5	BEIJING JIAOTONG UNIVERSITY	18
6	DELFT UNIVERSITY OF TECHNOLOGY	17
-	TSINGHUA UNIVERSITY	17
8	SHANGHAI MARITIME UNIVERSITY	16
-	TONGJI UNIVERSITY	16
-	UNIVERSITE GUSTAVE-EIFFEL	16

图 6 Part D 期刊发文机构 TOP10

RANK	COUNTRY / REGION	COUNT
1	USA	265
2	CHINA MAINLAND	261
3	England	94
4	GERMANY (FED REP GER)	74
5	Canada	60
6	Sweden	45
7	Australia	40
-	Netherlands	40
9	Norway	39
10	France	37

图 7 Part D 期刊发文国家 TOP10



表 2 Part D 最近一年期刊被引量 TOP20 文章

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
1	Moro, Alberto;Lonza, Laura	Electricity carbon intensity in European Member States: Impacts on GHG emissions of electric vehicles	2018	Article	70
2	Goodchild, Anne;Toy, Jordan	Delivery by drone: An evaluation of unmanned aerial vehicle technology in reducing CO2 emissions in the delivery service industry	2018	Article	39
3	Gnann, Till;Funke, Simon;Jakobsson, Niklas;Ploetz, Patrick;Sprei, Frances;Bennehag, Anders	Fast charging infrastructure for electric vehicles: Today's situation and future needs	2018	Article	38
4	Hardman, Scott;Kinnear, Neale;Ploetz, Patrick;Pontes, Jose;Refa, Nazir;Sprei, Frances;Turrentine, Tom;Witkamp, Bert;Jenn, Alan;Tal, Gil; et al.	A review of consumer preferences of and interactions with electric vehicle charging infrastructure	2018	Review	36
5	Sennaroglu, Bahar;Celebi, Gulsay Varlik	A military airport location selection by AHP integrated PROMETHEE and VIKOR methods	2018	Article	32
6	Axsen, Jonn;Sovacool, Benjamin K.	The roles of users in electric, shared and automated mobility transitions	2019	Article	28
7	Allen, J.;Friday, A.;Wise, S.;Austwick, M.;Piecyk, M.;Piotrowska, M.;McLeod, F.;Cherrett, T.;Ghali, K.;Nguyen, T.; et al.	Understanding the impact of e-commerce on last-mile light goods vehicle activity in urban areas: The case of London	2018	Article	27
8	Sun, Daniel (Jian);Zhang, Kaisheng;Shen, Suwan	Analyzing spatiotemporal traffic line source emissions based on massive didi online car-hailing service data	2018	Article	27

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
9	Rodrigues Teixeira, Ana Carolina;Sodre, Jose Ricardo	Impacts of replacement of engine powered vehicles by electric vehicles on energy consumption and CO2 emissions	2018	Article	26
10	Moon, HyungBin;Park, Stephen Youngjun;Jeong, Changhyun;Lee, Jongsu	Forecasting electricity demand of electric vehicles by analyzing consumers' charging patterns	2018	Article	24
11	Hu, Lingqian;Sun, Tieshan;Wang, Lanlan	Evolving urban spatial structure and commuting patterns: A case study of Beijing, China	2018	Article	22
12	Yu, Ang;Wei, Yiqun;Chen, Wenwen;Peng, Najun;Peng, Lihong	Life cycle environmental impacts and carbon emissions: A case study of electric and gasoline vehicles in China	2018	Article	20
13	Sun, Feiyang;Chen, Peng;Jiao, Junfeng	Promoting public bike-sharing: A lesson from the unsuccessful Pronto system	2018	Article	20
14	Dragovic, Branislav;Tzannatos, Ernestos;Tselentis, Vassilis;Mestrovic, Romeo;Skuric, Maja	Ship emissions and their externalities in cruise ports	2018	Article	18
15	Amjad, Muhammad;Ahmad, Ayaz;Rehmani, Mubashir Husain;Umer, Tariq	A review of EVs charging: From the perspective of energy optimization, optimization approaches, and charging techniques	2018	Review	17
16	Chang, Young-Tae;Park, Hyosoo (Kevin);Lee, Suhyung;Kim, Eunsoo	Have Emission Control Areas (ECAs) harmed port efficiency in Europe?	2018	Article	17
17	Feng, Xuesong;Zhu, Xiaojing;Qian, Xuepeng;Jie, Yuanpeng;Ma, Fei;Niu, Xuejun	A new transit network design study in consideration of transfer time composition	2019	Article	17

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
18	Yang, Zaili;Lau, Yui-Yip;Ng, Adolf K. Y.;Lee, Paul Tae-Woo;Wang, Tianni;Qu, Zhuohua;Rodrigues, Vasco Sanchez;Pettit, Stephen;Harris, Irina;Zhang, Di	Risk and cost evaluation of port adaptation measures to climate change impacts	2018	Article	17
19	Li, Yi;Du, Qiang;Lu, Xinran;Wu, Jiao;Han, Xiao	Relationship between the development and CO2 emissions of transport sector in China	2019	Article	17
20	Wang, Shengzheng;Ji, Baoxian;Zhao, Jiansen;Liu, Wei;Xu, Tie	Predicting ship fuel consumption based on LASSO regression	2018	Article	17

表 3 Part D 期刊最新收录文章

序号	详细信息	
1	作者	Fabio Cignini, Adriano Alessandrini, Fabio Orecchini, Adriano Santiangeli, Fabrizio Zuccari, Fernando Ortenzi,
	题名	A statistical analysis to compare results of different on-road vehicle performance testing,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001092">https://www.sciencedirect.com/science/article/pii/S1361920922001092</a>
	关键词	Hybrid vehicle; Electric vehicle; Fuel consumption; Testing campaign; Driving cycle; Kinematic sequence
2	作者	Meng Zhou, Donggen Wang, Xiaodong Guan,
	题名	Co-evolution of the built environment and travel behaviour in Shenzhen, China,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001195">https://www.sciencedirect.com/science/article/pii/S1361920922001195</a>
	关键词	Dynamics of the travel behaviour impacts of the built environment; Constant travel time budget; Urban expansion; Large-scale travel characteristics surveys; Shenzhen
3	作者	Anders Larsson, Erik Elld é, Evangelos Vafeiadis, Carey Curtis, Albert Steiner,
	题名	Exploring the potential for sustainable accessibility across settlement types. A Swedish case,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001250">https://www.sciencedirect.com/science/article/pii/S1361920922001250</a>
	关键词	Sustainable accessibility; Daily amenities; Settlement typology; Small Urban areas; Rural Areas; Modal accessibility gap
4	作者	Rebecca L. Sanders, Robert J. Schneider,
	题名	An exploration of pedestrian fatalities by race in the United States,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001262">https://www.sciencedirect.com/science/article/pii/S1361920922001262</a>
	关键词	Pedestrian; Fatalities; FARS; Race; Ethnicity; Equity

序号	详细信息	
5	作者	Kuiquan Duan, Qingbo Li, Hui Liu, Fuming Zhou, Jie Lu, Xiran Zhang, Zezhong Zhang, Shuang Wang, Ye Ma, Xiaofeng Wang,
	题名	Dynamic NOx emission factors for main engines of bulk carriers,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001183">https://www.sciencedirect.com/science/article/pii/S1361920922001183</a>
	关键词	NOx; Dynamic emission factors; Main engine loads; Speed modification; Ship emissions
6	作者	Lucy Maybury, Padraig Corcoran, Liana Cipcigan,
	题名	Mathematical modelling of electric vehicle adoption: A systematic literature review,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001067">https://www.sciencedirect.com/science/article/pii/S1361920922001067</a>
	关键词	Electric vehicles; Emerging technologies; Mathematical modelling; Sustainable mobility; Technology adoption; Transition theory
7	作者	Peng Luo, Gengxuan Guo, Wei Zhang,
	题名	The role of social influence in green travel behavior in rural China,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001122">https://www.sciencedirect.com/science/article/pii/S1361920922001122</a>
	关键词	Green travel behavior; Social influence; Similarity; Rural areas
8	作者	Fan Zhang, Yanjie Ji, Huitao Lv, Xinwei Ma, Chenchen Kuai, Wenhao Li,
	题名	Investigating factors influencing takeout shopping demand under COVID-19: Generalized additive mixed models,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001134">https://www.sciencedirect.com/science/article/pii/S1361920922001134</a>
	关键词	COVID-19; Takeout shopping demand; Built environment; Business circle; Generalized additive mixed model
9	作者	Lara Pomaska, Michele Acciaro,
	题名	Bridging the Maritime-Hydrogen Cost-Gap: Real options analysis of policy alternatives,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001110">https://www.sciencedirect.com/science/article/pii/S1361920922001110</a>
	关键词	Hydrogen; Alternative fuels; Real option analysis; Marine fuels; Maritime investments; Shipping

序号	详细信息	
10	作者	Josh Roll, Nathan McNeil,
	题名	Race and income disparities in pedestrian injuries: Factors influencing pedestrian safety inequity,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001225">https://www.sciencedirect.com/science/article/pii/S1361920922001225</a>
	关键词	Pedestrians; Safety; Equity; Ecological analysis; Mixed model; Injury
11	作者	Xilei Zhao, Yiming Xu, Ruggiero Lovreglio, Erica Kuligowski, Daniel Nilsson, Thomas J. Cova, Alex Wu, Xiang Yan,
	题名	Estimating wildfire evacuation decision and departure timing using large-scale GPS data,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136192092200102X">https://www.sciencedirect.com/science/article/pii/S136192092200102X</a>
	关键词	Wildfire evacuation; GPS data; Evacuation; Departure timing; Big data
12	作者	Eren Inci, Zeren Tatar Taspinar, Burc Ulengin,
	题名	A choice experiment on preferences for electric and hybrid cars in Istanbul,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001237">https://www.sciencedirect.com/science/article/pii/S1361920922001237</a>
	关键词	Electric vehicles; Hybrid vehicles; Parking; Urban policy incentives; Road pricing
13	作者	R. Smit, M. Awadallah, S. Bagheri, N.C. Surawski,
	题名	Real-world emission factors for SUVs using on-board emission testing and geo-computation,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001146">https://www.sciencedirect.com/science/article/pii/S1361920922001146</a>
	关键词	SUVs; Emission measurement; PEMS; On-board; RDE; Real-world
14	作者	Patrizio Tratzi, Marco Torre, Valerio Paolini, Laura Tomassetti, Cassandra Montiroli, Eros Manzo, Francesco Petracchini
	题名	Liquefied biomethane for heavy-duty transport in Italy: A well-to-wheels approach
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136192092200116X">https://www.sciencedirect.com/science/article/pii/S136192092200116X</a>

序号	详细信息	
15	作者	Qianwen Li, Saeid Soleimaniamiri, Xiaopeng Li,
	题名	Optimal mass evacuation planning for electric vehicles before natural disasters,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001201">https://www.sciencedirect.com/science/article/pii/S1361920922001201</a>
	关键词	Emergency evacuation; Vehicle routing; Vehicle scheduling; Electric vehicle; Charging station
16	作者	A. Chatzipanagi, J. Pavlovic, M.A. Ktistakis, D. Komnos, G. Fontaras,
	题名	Evolution of European light-duty vehicle CO2 emissions based on recent certification datasets,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001158">https://www.sciencedirect.com/science/article/pii/S1361920922001158</a>
	关键词	WLTP; NEDC; CO2 emissions; Vehicle emissions; Fuel consumption
17	作者	Xiaodong Zhang, Qi Yang, Xiaoqing Xu, Na Zhang,
	题名	Do urban motor vehicle restriction policies truly control urban air quality?,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001213">https://www.sciencedirect.com/science/article/pii/S1361920922001213</a>
	关键词	Air quality index; Traffic restriction policy; Multi-period difference-in-difference model; Air pollution; Traffic emission governance
18	作者	Astrid Bjørngen, Marianne Ryghaug,
	题名	Integration of urban freight transport in city planning: Lesson learned,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001389">https://www.sciencedirect.com/science/article/pii/S1361920922001389</a>
	关键词	Urban freight transport; City planning; Stakeholder engagement; Planning approach; Urban space
19	作者	Jaime Suarez, Michail Makridis, Aikaterini Anesiadou, Dimitrios Komnos, Biagio Ciuffo, Georgios Fontaras,
	题名	Benchmarking the driver acceleration impact on vehicle energy consumption and CO2 emissions,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001109">https://www.sciencedirect.com/science/article/pii/S1361920922001109</a>
	关键词	Driver heterogeneity; Driver characterization; Driving style; Energy consumption; WLTC; CO2 emissions

序号	详细信息	
20	作者	Pengfei Fan, Guohua Song, Zijun Zhu, Yizheng Wu, Zhiqiang Zhai, Lei Yu,
	题名	Road grade estimation based on Large-scale fuel consumption data of connected vehicles,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000918">https://www.sciencedirect.com/science/article/pii/S1361920922000918</a>
	关键词	Road Grade; Fuel Consumption; Vehicle Specific Power; Connected Vehicle
21	作者	Xiaowei Shi, Handong Yao, Zhaohui Liang, Xiaopeng Li,
	题名	An empirical study on fuel consumption of commercial automated vehicles,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000839">https://www.sciencedirect.com/science/article/pii/S1361920922000839</a>
	关键词	Automated vehicle; Adaptive cruise control; Fuel consumption; Headway settings
22	作者	Christine Gschwendtner, Konstantin Krauss,
	题名	Coupling transport and electricity: How can vehicle-to-grid boost the attractiveness of carsharing?,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000906">https://www.sciencedirect.com/science/article/pii/S1361920922000906</a>
	关键词	Carsharing; Vehicle-to-grid; Electric vehicle; Stated-choice experiment; Sector coupling; Sustainable transport
23	作者	Zheyang Chen, Dea van Lierop, Dick Ettema,
	题名	Travel satisfaction with dockless bike-sharing: Trip stages, attitudes and the built environment,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001080">https://www.sciencedirect.com/science/article/pii/S1361920922001080</a>
	关键词	Travel satisfaction; Dockless bike-sharing; Multistage; Mode comparison; Attitudes; Beijing
24	作者	Thomas Audrin, Philippe Apparicio, Anne-Marie S éguin,
	题名	Aircraft noise and environmental equity in Montréal: A comparison of noise indicators and an analysis of the impacts of COVID-19,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001031">https://www.sciencedirect.com/science/article/pii/S1361920922001031</a>
	关键词	Aircraft noise; Environmental equity; COVID-19; Noise indicators; Web data; GIS

序号	详细信息	
25	作者	Zijian Wang, Xiangdong Xu,
	题名	Assessing route redundancy of freeway networks in Mega-city regions,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001043">https://www.sciencedirect.com/science/article/pii/S1361920922001043</a>
	关键词	Mega-city region; Redundancy; Resilience; Route diversity; Alternative route gathering degree
26	作者	Aud Tennøy,
	题名	Patronage effects of changes to local public transport services in smaller cities,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922001055">https://www.sciencedirect.com/science/article/pii/S1361920922001055</a>
	关键词	Local public transport; Public transport improvements; Patronage; Small and medium-sized cities; Sustainable mobility
27	作者	Marco Pretto, Pietro Giannattasio, Michele De Gennaro,
	题名	Mixed analysis-synthesis approach for estimating airport noise from civil air traffic,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000785">https://www.sciencedirect.com/science/article/pii/S1361920922000785</a>
	关键词	Civil air traffic; Flight tracking; Data collection; Doc 29 noise computation method; Flight profile optimization; Airport noise
28	作者	S. Mojtaba Lajevardi, Jonn Axsen, Curran Crawford,
	题名	Simulating competition among heavy-duty zero-emissions vehicles under different infrastructure conditions,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000840">https://www.sciencedirect.com/science/article/pii/S1361920922000840</a>
	关键词	Simulation model; ZEV mandate; Heavy-duty trucks; Alternative drivetrains; Market share
29	作者	M.J. Anderson, D.A.F. Kiddle, T.M. Logan,
	题名	The underestimated role of the transportation network: Improving disaster & community resilience,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000487">https://www.sciencedirect.com/science/article/pii/S1361920922000487</a>
	关键词	Resilience; Transport networks; Equity; Accessibility; Urban planning; Natural hazards

序号	详细信息	
30	作者	Xin Li, Weihang Xu, Tianqi Wang, Yun Yuan,
	题名	Infrastructure enabled eco-approach for transit system: A simulation approach,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000943">https://www.sciencedirect.com/science/article/pii/S1361920922000943</a>
	关键词	Infrastructure Enabled Autonomy (IEA); Eco-approach; Transit system; Bus holding; CO2 emission
31	作者	Dan Wei, Adam Rose, Eyuphan Koc, Zhenhua Chen, Lucio Soibelman,
	题名	Socioeconomic impacts of resilience to seaport and highway transportation network disruption,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000669">https://www.sciencedirect.com/science/article/pii/S1361920922000669</a>
	关键词	Port disruptions; Transportation networks; Resilience to disasters; Socioeconomic impacts; Integrated transportation-economic model
32	作者	Federico Cavallaro, Silvio Nocera,
	题名	Are transport policies and economic appraisal aligned in evaluating road externalities?,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000955">https://www.sciencedirect.com/science/article/pii/S1361920922000955</a>
	关键词	Noise emissions; Greenhouse gases; Photovoltaic noise barriers; Motorway; Brenner corridor
33	作者	Sotiria Lagouvardou, Harilaos N. Psaraftis, Thalys Zis,
	题名	Impacts of a bunker levy on decarbonizing shipping: A tanker case study,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000876">https://www.sciencedirect.com/science/article/pii/S1361920922000876</a>
	关键词	Market-based measures; Shipping decarbonization; GHG emissions; IMO; Bunker levy; Freight rates
34	作者	Keke Lou, Peng Xiao, Aihong Kang, Zhengguang Wu, Xinghai Dong,
	题名	Effects of asphalt pavement characteristics on traffic noise reduction in different frequencies,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136192092200089X">https://www.sciencedirect.com/science/article/pii/S136192092200089X</a>
	关键词	Traffic noise; Stone Mastic Asphalt; Porous Asphalt; Specific frequency band; Water submerged; Voids-clogging

序号	详细信息	
35	作者	Zhiyan Yi, Xiaoyue Cathy Liu, Ran Wei,
	题名	Electric vehicle demand estimation and charging station allocation using urban informatics,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1361920922000931">https://www.sciencedirect.com/science/article/pii/S1361920922000931</a>
	关键词	Electric vehicles; PageRank model; Charging infrastructure optimization; Spatiotemporal travel patterns

## 2. Transportation Research Part E: Logistics and Transportation Review

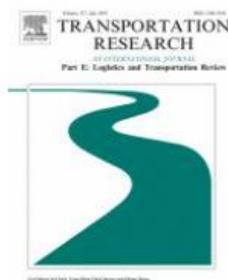


图9 Part E 期刊封面

(1) 期刊网址: [\\_](https://www.sciencedirect.com/journal/transportation-research-part-e-logistics-and-transportation-review)

<https://www.sciencedirect.com/journal/transportation-research-part-e-logistics-and-transportation-review>

(2) 期刊介绍: 《Transportation Research Part E: Logistics and Transportation Review》发表关于物流和运输研究的文章。主题包括但不限于运输经济学, 涵盖成本和生产函数、能力、需求、定价、外部性、模态研究; 交通基础设施及投资评估; 交通相关公共政策评价; 物流管理实践和绩效的实证分析研究; 物流和运营模式, 特别是应用程序; 物流和供应链管理等。\_

(3) 出版信息:

**ISSN: 1366-5545      EISSN: 1878-5794**

Publisher information		
PUBLISHER	ADDRESS	PUBLICATION FREQUENCY
PERGAMON-ELSEVIER SCIENCE LTD	THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND	12 issues/year

图10 Part E 期刊出版信息

(4) JCR 收录情况: 隶属于 TRANSPORTATION – SSCI; ECONOMICS – SSCI; ENGINEERING, CIVIL – SCIE; OPERATIONS RESEARCH & MANAGEMENT SCIENCE – SCIE; TRANSPORTATION SCIENCE & TECHNOLOGY – SCIE 5 个学科, 排名分别为:

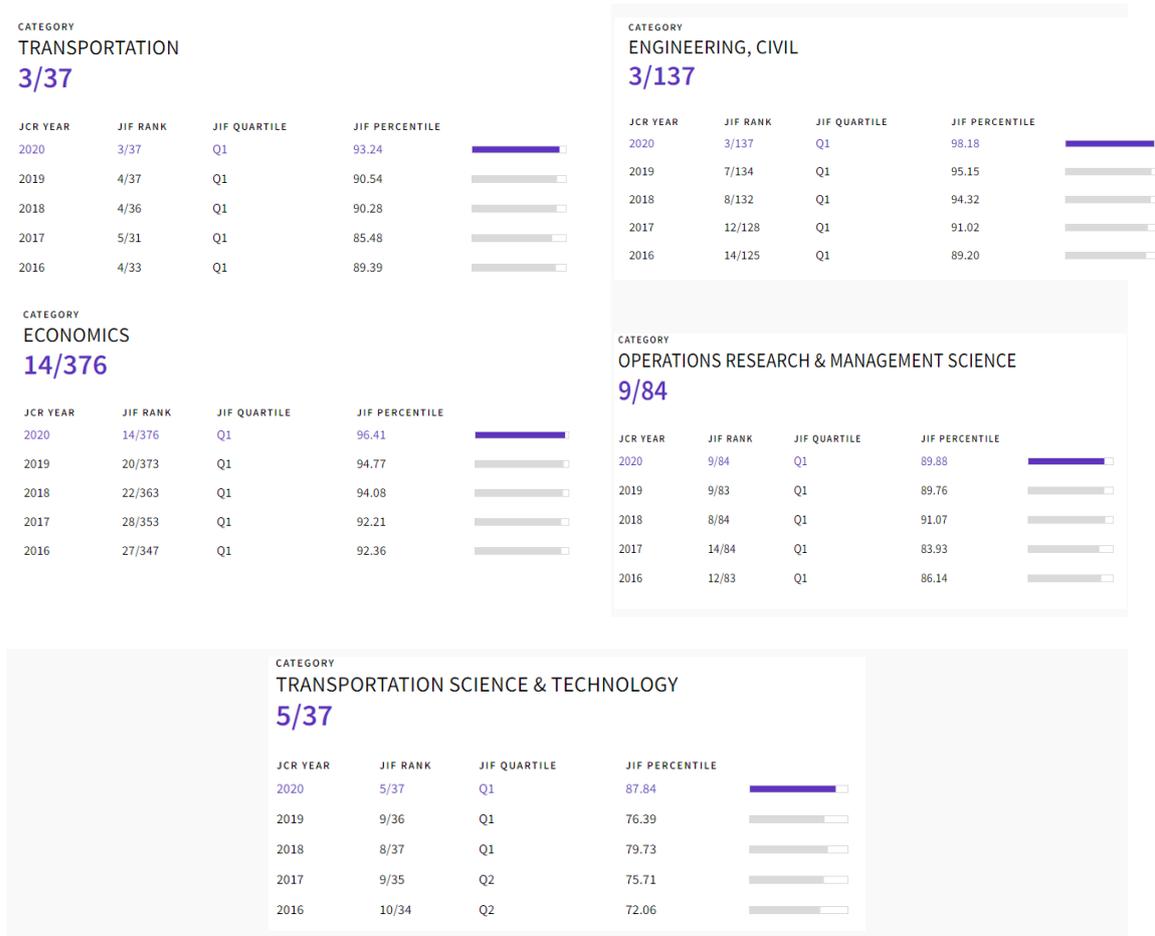


图 11 Part E 期刊分区情况



图 12 Part E 期刊隶属学科影响因子趋势图

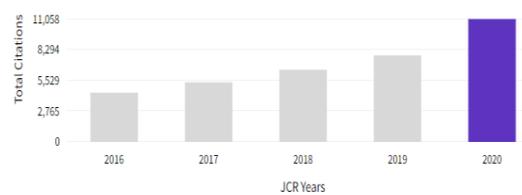


图 13 Part E 期刊总被引量趋势图

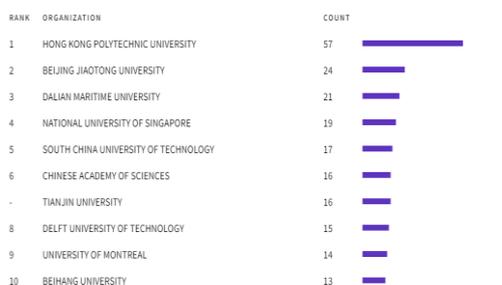


图 14 Part E 期刊发文机构 TOP10



图 15 Part E 期刊发文国家 TOP10



表 4 Part E 近一年期刊被引量 TOP20 文章

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
1	Hosseini, Seyedmohsen;Ivanov, Dmitry;Dolgui, Alexandre	Review of quantitative methods for supply chain resilience analysis	2019	Review	69
2	Choi, Tsan-Ming;Wen, Xin;Sun, Xuting;Chung, Sai-Ho	The mean-variance approach for global supply chain risk analysis with air logistics in the blockchain technology era	2019	Article	54
3	Choi, Tsan-Ming	Blockchain-technology-supported platforms for diamond authentication and certification in luxury supply chains	2019	Article	40
4	Arunachalam, Deepak;Kumar, Niraj;Kawalek, John Paul	Understanding big data analytics capabilities in supply chain management: Unravelling the issues, challenges and implications for practice	2018	Article	37
5	Li, Guo;Li, Lin;Sun, Jiasen	Pricing and service effort strategy in a dual-channel supply chain with showrooming effect	2019	Article	36
6	Choi, Tsan-Ming;Luo, Suyuan	Data quality challenges for sustainable fashion supply chain operations in emerging markets: Roles of blockchain, government sponsors and environment taxes	2019	Article	36
7	Singh, Akshit;Shukla, Nagesh;Mishra, Nishikant	Social media data analytics to improve supply chain management in food industries	2018	Article	30
8	Tang, Christopher S.;Veelenturf, Lucas P.	The strategic role of logistics in the industry 4.0 era	2019	Article	30
9	Liu, Zhi;Li, Kevin W.;Li, Bang-Yi;Huang, Jun;Tang, Juan	Impact of product-design strategies on the operations of a closed-loop supply chain	2019	Article	30
10	Choi, Tsan-Ming;He, Yanyan	Peer-to-peer collaborative consumption for fashion products in the sharing economy: Platform operations	2019	Article	28

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
11	Govindan, Kannan;Cheng, T. C. E.;Mishra, Nishikant;Shukla, Nagesh	Big data analytics and application for logistics and supply chain management	2018	Article	27
12	Liu, Xiaotong;Zhang, Kai;Chen, Bokui;Zhou, Jun;Miao, Lixin	Analysis of logistics service supply chain for the One Belt and One Road initiative of China	2018	Article	25
13	Yu, Wantao;Chavez, Roberto;Jacobs, Mark A.;Feng, Mengying	Data-driven supply chain capabilities and performance: A resource-based view	2018	Article	22
14	Fattahi, Mohammad;Govindan, Kannan	A multi-stage stochastic program for the sustainable design of biofuel supply chain networks under biomass supply uncertainty and disruption risk: A real-life case study	2018	Article	22
15	Wan, Chengpeng;Yan, Xinping;Zhang, Di;Qu, Zhuohua;Yang, Zaili	An advanced fuzzy Bayesian-based FMEA approach for assessing maritime supply chain risks	2019	Article	21
16	Wu, Weitiao;Liu, Ronghui;Jin, Wenzhou;Ma, Changxi	Simulation-based robust optimization of limited-stop bus service with vehicle overtaking and dynamics: A response surface methodology	2019	Article	21
17	Guo, Fang;Yang, Jun;Lu, Jianyi	The battery charging station location problem: Impact of users' range anxiety and distance convenience	2018	Article	21
18	Sheu, Jih Biing;Kundu, Tanmoy	Forecasting time-varying logistics distribution flows in the One Belt-One Road strategic context	2018	Article	20
19	Jiang, Yonglei;Sheu, Jih-Biing;Peng, Zixuan;Yu, Bin	Hinterland patterns of China Railway (CR) express in China under the Belt and Road Initiative: A preliminary analysis	2018	Article	20
20	Hong, Zhaofu;Wang, Hao;Yu, Yugang	Green product pricing with non-green product reference	2018	Article	19

表 5 Part E 期刊最新收录文章

序号	详细信息	
1	作者	Ziling Zeng, Shuaian Wang, Xiaobo Qu,
	题名	On the role of battery degradation in en-route charge scheduling for an electric bus system,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001181">https://www.sciencedirect.com/science/article/pii/S1366554522001181</a>
	关键词	Charge scheduling; En-route charging; Peak-to-average power ratio; Battery wear cost; Time-of-use rate
2	作者	Masih Fadaki, Ahmad Abareshi, Shaghayegh Maleki Far, Paul Tae-Woo Lee,
	题名	Multi-period vaccine allocation model in a pandemic: A case study of COVID-19 in Australia,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000825">https://www.sciencedirect.com/science/article/pii/S1366554522000825</a>
	关键词	Vaccine supply chain; Allocation models; Multi-period decision making; COVID-19 pandemic; Capacity sharing; Mobile units
3	作者	Wu Hao, Layla Martin,
	题名	Prohibiting cherry-picking: Regulating vehicle sharing services who determine fleet and service structure,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000849">https://www.sciencedirect.com/science/article/pii/S1366554522000849</a>
	关键词	Regulations; Second-Order Cone Programming; Vehicle sharing
4	作者	Zhijia Tan, Xianyang Zeng, Shuai Shao, Jihong Chen, Hua Wang,
	题名	Scrubber installation and green fuel for inland river ships with non-identical streamflow,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000710">https://www.sciencedirect.com/science/article/pii/S1366554522000710</a>
	关键词	Emission regulation; Inland river container shipping; Scrubber installation; Green fuel; Sailing speed optimization
5	作者	Imadeddine Aziez, Jean-François Côté, Leandro C. Coelho,
	题名	Fleet sizing and routing of healthcare automated guided vehicles,

序号	详细信息	
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000734">https://www.sciencedirect.com/science/article/pii/S1366554522000734</a>
	关键词	Automated guided vehicles; Healthcare logistics; Fleet sizing problem
6	作者	Yuta Kittaka, Noriaki Matsushima, Fuyuki Saruta,
	题名	Negative effect of price-matching policy on traditional retailers in a dual-channel supply chain with different content formats,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136655452200076X">https://www.sciencedirect.com/science/article/pii/S136655452200076X</a>
	关键词	Agency contract; Price-quantity competition; Dual-channel supply chain; Royalty rate
7	作者	Shukai Chen, Qiang Meng, Tsan-Ming Choi,
	题名	Transportation research Part E-logistics and transportation review: 25 years in retrospect,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001004">https://www.sciencedirect.com/science/article/pii/S1366554522001004</a>
	关键词	Bibliometric analysis; Hot research topics; Research trend analysis; Future research directions
8	作者	Lu Zhen, Wencheng Wang, Shumin Lin,
	题名	Analytical comparison on two incentive policies for shore power equipped ships in berthing activities,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000795">https://www.sciencedirect.com/science/article/pii/S1366554522000795</a>
	关键词	Shore power; Government-subsidy-based incentive policy; Berthing-priority-based incentive policy; Policy analysis; Optimization approach
9	作者	Weitiao Wu, Jian Ma, Ronghui Liu, Wenzhou Jin,
	题名	Multi-class hazmat distribution network design with inventory and superimposed risks,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000850">https://www.sciencedirect.com/science/article/pii/S1366554522000850</a>
	关键词	Distribution network design; Multi-class hazmat; Risk assessment; Multi-objective optimization; Cyclic dissimilarity-based elitist selection

序号	详细信息	
10	作者	Ximing Chang, Jianjun Wu, Gon alo Homem de Almeida Correia, Huijun Sun, Ziyang Feng,
	题名	A cooperative strategy for optimizing vehicle relocations and staff movements in cities where several carsharing companies operate simultaneously,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001028">https://www.sciencedirect.com/science/article/pii/S1366554522001028</a>
	关键词	One-way carsharing; Multi-step demand forecasting; Graph convolutional network; Cooperative relocation; Staff rebalancing
11	作者	Yifan Cao, Bin Shen,
	题名	Adopting blockchain technology to block less sustainable products' entry in global trade,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000874">https://www.sciencedirect.com/science/article/pii/S1366554522000874</a>
	关键词	Sustainability; Entry deterrence; Blockchain; Chain-to-chain competition; Global trade
12	作者	Hongqiang Fan, Lifen Yun, Xiaopeng Li,
	题名	A linear-time crystal-growth algorithm for discretization of continuum approximation,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001065">https://www.sciencedirect.com/science/article/pii/S1366554522001065</a>
	关键词	Continuum approximation; Discretization; Facility location; Spatial searching
13	作者	Abhishek Srivastava, Rajeev Ranjan Kumar, Abhishek Chakraborty, Arqum Mateen, Gopalakrishnan Narayanamurthy,
	题名	Design and selection of government policies for electric vehicles adoption: A global perspective,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136655452200117X">https://www.sciencedirect.com/science/article/pii/S136655452200117X</a>
	关键词	Electric vehicles; Taxation; Subsidy; Social welfare; Environmental impact
14	作者	Lihong Cheng, Xiaolong Guo, Xiaoxiao Li, Yugang Yu,
	题名	Data-driven ordering and transshipment decisions for online retailers and logistics service providers,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000771">https://www.sciencedirect.com/science/article/pii/S1366554522000771</a>

序号	详细信息	
	关键词	Preventive transshipment; Logistics service provider; Data-driven inventory transshipment
15	作者	Arijit De, Matthew Gorton, Carmen Hubbard, Paulus Aditjandra,
	题名	Optimization model for sustainable food supply chains: An application to Norwegian salmon,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001144">https://www.sciencedirect.com/science/article/pii/S1366554522001144</a>
	关键词	Transportation; Food supply chains; Optimization; Carbon emissions; Mixed-integer linear programming; Salmon
16	作者	Weihua Liu, Shuang Wei, Kevin W. Li, Shangsong Long,
	题名	Supplier participation in digital transformation of a two-echelon supply chain: Monetary and symbolic incentives,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000813">https://www.sciencedirect.com/science/article/pii/S1366554522000813</a>
	关键词	Monetary incentives; Symbolic incentives; Supplier participation; Digital transformation
17	作者	Shaofu Du, Jianchao Sheng, Jing Peng, Yangguang Zhu,
	题名	Competitive implications of personalized pricing with a dominant retailer,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000837">https://www.sciencedirect.com/science/article/pii/S1366554522000837</a>
	关键词	Personalized pricing; Price discrimination; Asymmetric channel; Competition; Consumer identity management
18	作者	Wenjuan Yang, Jiantong Zhang, Hong Yan,
	题名	Promotions of online reviews from a channel perspective
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000886">https://www.sciencedirect.com/science/article/pii/S1366554522000886</a>
	关键词	Online reviews; Promotion of reviews; Game theory; Supply chain management
19	作者	Xiaoqing Chen, Feng Li, Jiehui Jiang, Bin Jia, Andrew Lim, Jianjun Wu,
	题名	Data-driven optimization: A flexible route pricing method for Non-Truck Operating Common Carriers,

序号	详细信息	
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000722">https://www.sciencedirect.com/science/article/pii/S1366554522000722</a>
	关键词	NTOCCs; Freight carriers; Data-driven flexible pricing method; Two-category phased payment strategy; Route price prediction model
20	作者	Chin-Yi Tseng, Chia-Yen Lee, Qunwei Wang, Changsong Wu,
	题名	Data envelopment analysis and stochastic equilibrium analysis for market power investigation in a bi-level market,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000965">https://www.sciencedirect.com/science/article/pii/S1366554522000965</a>
	关键词	Data envelopment analysis; Market power; Equilibrium analysis; Bi-level market; Stochastic programming; Robust optimization
21	作者	Sina Bahrami, Mehdi Nourinejad, Mahmood Mahmoodi Nesheli, Yafeng Yin,
	题名	Optimal composition of solo and pool services for on-demand ride-hailing,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000746">https://www.sciencedirect.com/science/article/pii/S1366554522000746</a>
	关键词	Ride-hailing; Pooling; Bilateral meeting; Closed-queue systems
22	作者	Yanjun Wang, Max Z. Li, Karthik Gopalakrishnan, Tongdan Liu,
	题名	Timescales of delay propagation in airport networks,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000801">https://www.sciencedirect.com/science/article/pii/S1366554522000801</a>
	关键词	Delay propagation; Air transportation; Network science; Statistical analysis
23	作者	Yugang Yu, Yifei Luo, Ye Shi,
	题名	Adoption of blockchain technology in a two-stage supply chain: Spillover effect on workforce,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000783">https://www.sciencedirect.com/science/article/pii/S1366554522000783</a>
	关键词	Blockchain technology; Inventory management with credit; Information transparency; Supply chain workforce
24	作者	Yang Liu, Fanyou Wu, Cheng Lyu, Shen Li, Jieping Ye, Xiaobo Qu,

序号	详细信息	
	题名	Deep dispatching: A deep reinforcement learning approach for vehicle dispatching on online ride-hailing platform,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522000862">https://www.sciencedirect.com/science/article/pii/S1366554522000862</a>
	关键词	Vehicle dispatching; Deep reinforcement learning; Load balancing
25	作者	Klaas Fiete Krutein, Anne Goodchild,
	题名	The isolated community evacuation problem with mixed integer programming,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001016">https://www.sciencedirect.com/science/article/pii/S1366554522001016</a>
	关键词	Mixed integer programming; Evacuation routing; Emergency management; Planning under uncertainty; Routing; Heuristics
26	作者	Ido Orenstein, Tal Raviv,
	题名	Parcel delivery using the hyperconnected service network,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001077">https://www.sciencedirect.com/science/article/pii/S1366554522001077</a>
	关键词	Transportation and logistics; Network design; Hyperconnected service network; Physical internet; Parcel delivery; Vehicle routing
27	作者	Siyavash Filom, Amir M. Amiri, Saiedeh Razavi,
	题名	Applications of machine learning methods in port operations – A systematic literature review,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001132">https://www.sciencedirect.com/science/article/pii/S1366554522001132</a>
	关键词	Seaport; Port; Machine learning; Data analytics; Systematic literature review; Container terminals
28	作者	Muren, Shiyuan Zhang, Lianlian Hua, Bo Yu,
	题名	Peak-easing strategies for urban subway operations in the context of COVID-19 epidemic,
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1366554522001156">https://www.sciencedirect.com/science/article/pii/S1366554522001156</a>
	关键词	COVID-19 pandemic; Subway peak-easing; Mixed integer programming; Work and production resumption of enterprise; Peak-staggering commuting

### 3. Transportation Research Part F: Traffic Psychology and Behaviour

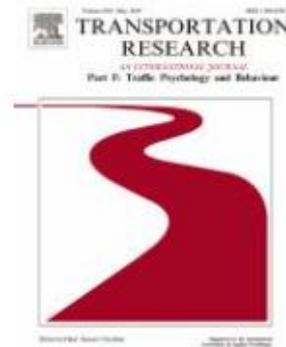


图 17 Part F 期刊封面

(1) 期刊网址:

<https://www.sciencedirect.com/journal/transportation-research-part-f-traffic-psychology-and-behaviour>

(2) 期刊介绍:《Transportation Research Part F: Traffic Psychology and Behaviour》侧重于交通行为和心理方面的研究。该期刊的宗旨是促进理论发展及研究成果在实践中的应用。该期刊为对交通和运输心理学感兴趣的交通研究人员、心理学家、人体工程学家、工程师和政策制定者提供了论坛。

(3) 出版信息:

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图 18 PartF 期刊出版信息

(4) JCR 收录情况: 隶属于 TRANSPORTATION-SSCI、PSYCHOLOGY, APPLIED-SSCI 两个学科, 学科排名分别为:



表 6 Part F 近一年期刊被引量 TOP20 文章

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
1	Wu, Jingwen;Liao, Hua;Wang, Jin-Wei;Chen, Tianqi	The role of environmental concern in the public acceptance of autonomous electric vehicles: A survey from China	2019	Article	33
2	Liljamo, Timo;Liimatainen, Heikki;Pollanen, Markus	Attitudes and concerns on automated vehicles	2018	Article	32
3	Acheampong, Ransford A.;Cugurullo, Federico	Capturing the behavioural determinants behind the adoption of autonomous vehicles: Conceptual frameworks and measurement models to predict public transport, sharing and ownership trends of self-driving cars	2019	Article	26
4	Nordhoff, Sina;de Winter, Joost;Madigan, Ruth;Merat, Natasha;van Arem, Bart;Happee, Riender	User acceptance of automated shuttles in Berlin-Schoneberg: A questionnaire study	2018	Article	24
5	Guo, Yanyong;Li, Zhibin;Wu, Yao;Xu, Chengcheng	Evaluating factors affecting electric bike users' registration of license plate in China using Bayesian approach	2018	Article	22
6	Molnar, Lisa J.;Ryan, Lindsay H.;Pradhan, Anuj K.;Eby, David W.;St Louis, Renee M.;Zakrajsek, Jennifer S.	Understanding trust and acceptance of automated vehicles: An exploratory simulator study of transfer of control between automated and manual driving	2018	Article	21
7	Deb, Shuchisnigdha;Strawderman, Lesley J.;Carruth, Daniel W.	Investigating pedestrian suggestions for external features on fully autonomous vehicles: A virtual reality experiment	2018	Article	20
8	Kita, Erez;Luria, Gil	The mediating role of smartphone addiction on the relationship between personality and young drivers' smartphone use while driving	2018	Article	17

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
9	Nordhoff, Sina;de Winter, Joost;Payre, William;van Arem, Bart;Happee, Riender	What impressions do users have after a ride in an automated shuttle? An interview study	2019	Article	17
10	Zhang, Bo;de Winter, Joost;Varotto, Silvia;Happee, Riender;Martens, Marieke	Determinants of take-over time from automated driving: A meta-analysis of 129 studies	2019	Article	16
11	Palmeiro, Ana Rodriguez;van der Kint, Sander;Vissers, Luuk;Farah, Haneen;de Winter, Joost C. F.;Hagenzieker, Marjan	Interaction between pedestrians and automated vehicles: A Wizard of Oz experiment	2018	Article	15
12	De Vos, Jonas	Satisfaction-induced travel behaviour	2019	Article	14
13	Vivoda, Jonathon M.;Harmon, Annie C.;Babulal, Ganesh M.;Zikmund-Fisher, Brian J.	E-hail (rideshare) knowledge, use, reliance, and future expectations among older adults	2018	Article	14
14	Li, Xiaomeng;Oviedo-Trespalacios, Oscar;Rakotonirainy, Andry;Yan, Xuedong	Collision risk management of cognitively distracted drivers in a car-following situation	2019	Article	14
15	Hartwich, Franziska;Witzlack, Claudia;Beggiato, Matthias;Krems, Josef F.	The first impression counts - A combined driving simulator and test track study on the development of trust and acceptance of highly automated driving	2019	Article	13
16	Amirkiaee, S. Yasaman;Evangelopoulos, Nicholas	Why do people rideshare? An experimental study	2018	Article	13
17	Du, Huibin;Liu, Diyi;Sovacool, Benjamin K.;Wang, Yuru;Ma, Shoufeng;Li, Rita Yi Man	Who buys New Energy Vehicles in China? Assessing social-psychological predictors of purchasing awareness, intention, and policy	2018	Article	13
18	Cassarino, Marica;Murphy, Gillian	Reducing young drivers' crash risk: Are we there yet? An ecological systems-based review of the last decade of research	2018	Article	13

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
19	Bellem, Hanna;Thiel, Barbara;Schrauf, Michael;Krems, Josef F.	Comfort in automated driving: An analysis of preferences for different automated driving styles and their dependence on personality traits	2018	Article	13
20	Wu, Jianqing;Xu, Hao	The influence of road familiarity on distracted driving activities and driving operation using naturalistic driving study data	2018	Article	13

表 7 PartF 期刊最新收录文章

序号	详细信息	
1	作者	Bart Jelijs, Joost Heutink, Dick de Waard, Karel A. Brookhuis, Bart J.M. Melis-Dankers
	题名	Compensatory behaviour of visually impaired cyclists in everyday settings
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000717">https://www.sciencedirect.com/science/article/pii/S1369847822000717</a>
	关键词	Low vision; Partially sighted; Visual function impairment; Vision rehabilitation; Bicycle; Naturalistic cycling
2	作者	Michelle E.L. Wotton, Joanne M. Bennett, Oscar Modesto, Kirsten L. Challinor, Prasannah Prabhakaran
	题名	Attention all 'drivers': You could be to blame, no matter your behaviour or the level of vehicle automation
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000626">https://www.sciencedirect.com/science/article/pii/S1369847822000626</a>
3	作者	C. Gasne, L. Paire-Ficout, S. Bordel, S. Lafont, M. Ranchet
	题名	Takeover performance of older drivers in automated driving: A review
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000845">https://www.sciencedirect.com/science/article/pii/S1369847822000845</a>
	关键词	Older drivers; Automated driving; Takeover; Cognitive function; Simulator
4	作者	Alex Taima Costa, Aurenice C. Figueira, Ana Paula C. Larocca
	题名	An eye-tracking study of the effects of dimensions of speed limit traffic signs on a mountain highway on drivers' perception
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000547">https://www.sciencedirect.com/science/article/pii/S1369847822000547</a>
	关键词	Speed limit signs; Speeding; Driver's perception; Eye-tracking; Low-cost interventions
5	作者	Mohammadjavad Javadinasr, Sina Asgharpour, Ehsan Rahimi, Pooria Choobchian, Abolfazl Kouros Mohammadian, Joshua Auld
	题名	Eliciting attitudinal factors affecting the continuance use of E-scooters: An empirical study in Chicago
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000602">https://www.sciencedirect.com/science/article/pii/S1369847822000602</a>
	关键词	E-scooter; Micromobility; Continuance adoption; Technology acceptance; Reliability; Sustainability

序号	详细信息	
6	作者	Emily H. Cooley, David M. Sanbonmatsu, David L. Strayer, Paul H. White, Joel M. Cooper
	题名	On-Road vehicle study of the experience of automated driving
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000821">https://www.sciencedirect.com/science/article/pii/S1369847822000821</a>
	关键词	Partially automated vehicles; Driving enjoyment; Driving stress; Purchase intentions
7	作者	Mark Colley, Bastian Wankmüller, Tim Mend, Thomas V äh, Enrico Rukzio, Jan Gugenheimer
	题名	User gesticulation inside an automated vehicle with external communication can cause confusion in pedestrians and a lower willingness to cross
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000523">https://www.sciencedirect.com/science/article/pii/S1369847822000523</a>
	关键词	External communication; Interaction design; Mode confusion
8	作者	Nandita Basu, Oscar Oviedo-Trespalacios, Mark King, Md. Kamruzzaman, Md. Mazharul Haque
	题名	The influence of the built environment on pedestrians' perceptions of attractiveness, safety and security
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136984782200047X">https://www.sciencedirect.com/science/article/pii/S136984782200047X</a>
	关键词	Active travel; Road user behaviour; Urban planning; Econometric modelling; Vulnerable road users; Women issues in transport
9	作者	Willem Vlakveld, Charles Goldenbeld, Jolieke De Groot
	题名	Road signs depicting childrens's book illustrations temporarily reduce speed on urban roads
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000742">https://www.sciencedirect.com/science/article/pii/S1369847822000742</a>
	关键词	Speed reduction; Traffic calming; Nudge; Priming
10	作者	Nora Reinolsmann, Wael Alhajyaseen, Tom Brijs, Ali Pirdavani, Veerle Ross, Qinaat Hussain, Kris Brijs
	题名	Delay or travel time information? The impact of advanced traveler information systems on drivers' behavior before freeway work zones

序号	详细信息	
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000882">https://www.sciencedirect.com/science/article/pii/S1369847822000882</a>
	关键词	Time display; Delay update; Route choice; Driving simulator; Behavior; Eye-fixations
11	作者	A.N. Stephens, B. Collette, A. Hidalgo-Munoz, A. Fort, M. Evennou, C. Jallais
	题名	The quiet passenger: Cognitions, avoidance, and onset among people with driving anxiety
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000584">https://www.sciencedirect.com/science/article/pii/S1369847822000584</a>
	关键词	Driver anxiety; Driving cognitions; Driving avoidance
12	作者	Ricardo Chahine, F. Jordan Srouf, Maria-Jose Sanchez-Ruiz, Gaelle Abi Younes, John Khoury
	题名	Analyzing driver's response to the yellow onset at signalized intersections
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000560">https://www.sciencedirect.com/science/article/pii/S1369847822000560</a>
	关键词	Driving behavior; Driving simulator; Mindfulness; Impulsiveness; Yellow phase; Hierarchical clustering; Psychological traits
13	作者	Frauke Luise Berghoefer, Mark Vollrath
	题名	Cyclists' perception of cycling infrastructure – A Repertory Grid approach
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000808">https://www.sciencedirect.com/science/article/pii/S1369847822000808</a>
	关键词	Cyclists' route choice; Route attributes; Route criteria; Safety; Comfort; Convenience; Stress; Qualitative research
14	作者	Alessandro Calvi, Claudio Petrella
	题名	An evaluation of the effectiveness of countermeasures for improving the safety of dilemma zones: A driving simulator study
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136984782200081X">https://www.sciencedirect.com/science/article/pii/S136984782200081X</a>
	关键词	Dilemma zone; Signalized intersection; Driving simulator; Driving performance; Road safety; Safety countermeasures
15	作者	Vanessa Stange, Matthias Kühn, Mark Vollrath

序号	详细信息	
	题名	Safety at first sight? – Manual drivers' experience and driving behavior at first contact with Level 3 vehicles in mixed traffic on the highway
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000729">https://www.sciencedirect.com/science/article/pii/S1369847822000729</a>
	关键词	Automated driving; Mixed traffic; Highway; Manual Driver; Interaction
16	作者	Vishnu Radhakrishnan, Natasha Merat, Tyron Louw, Rafael Cirino Gonçalves, Guilhermina Torrao, Wei Lyu, Pablo Puente Guillen, Michael G. Lenné
	题名	Physiological indicators of driver workload during car-following scenarios and takeovers in highly automated driving
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000705">https://www.sciencedirect.com/science/article/pii/S1369847822000705</a>
	关键词	Workload; Car-following; Psychophysiology; Heart-rate variability (HRV); Electrodermal activity (EDA); Highly automated driving (HAD)
17	作者	Vanessa Stange, Matthias Kühn, Mark Vollrath
	题名	Manual drivers' experience and driving behavior in repeated interactions with automated Level 3 vehicles in mixed traffic on the highway
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000869">https://www.sciencedirect.com/science/article/pii/S1369847822000869</a>
	关键词	Automated driving; Mixed traffic; Manual driver; External human-machine interface; Driving simulator
18	作者	Maximilian Hübner, Alexander Feierle, Michael Rettenmaier, Klaus Bengler
	题名	External communication of automated vehicles in mixed traffic: Addressing the right human interaction partner in multi-agent simulation
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000857">https://www.sciencedirect.com/science/article/pii/S1369847822000857</a>
	关键词	Automated driving; External HMI; Mixed traffic; Movement design; Multi-agent simulation; Road bottleneck scenario

序号	详细信息	
19	作者	K.B. Stefanidis, V. Truelove, J. Freeman, L. Mills, M. Nicolls, K. Sutherland, J. Davey
	题名	A double-edged sword? Identifying the influence of peers, mass and social media on engagement in mobile phone use while driving
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000559">https://www.sciencedirect.com/science/article/pii/S1369847822000559</a>
	关键词	Social media; Mass media; Peer influences; Phone use while driving; Driver distraction
20	作者	Angelica M. Tinga, Diane Cleij, Reinier J. Jansen, Sander van der Kint, Nicole van Nes
	题名	Human machine interface design for continuous support of mode awareness during automated driving: An online simulation
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000614">https://www.sciencedirect.com/science/article/pii/S1369847822000614</a>
	关键词	HMI; Automated driving; Mode awareness; Human factors in vehicle automation; Think-aloud; NDRA
21	作者	Elizabeth A. Walshe, Michael R. Elliott, Daniel Romer, Shukai Cheng, Allison E. Curry, Tom Seacrist, Natalie Oppenheimer, Abraham J. Wyner, David Grethlein, Alexander K. Gonzalez, Flaura K. Winston
	题名	Novel use of a virtual driving assessment to classify driver skill at the time of licensure
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000778">https://www.sciencedirect.com/science/article/pii/S1369847822000778</a>
	关键词	New Driver Skills; License Examination; Virtual Driving Assessment; Novice Drivers; Driver Safety
22	作者	Pål Ulleberg, Torkel Bjørnskau, Knut Inge Fostervold
	题名	Does age matter? Examining age-dependent differences in at-fault collisions after attending a refresher course for older drivers
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000833">https://www.sciencedirect.com/science/article/pii/S1369847822000833</a>
	关键词	Older drivers; Educational courses; Evaluation; Collision risk
23	作者	Peng Liu, Manqing Du, Zhigang Xu, Yueying Chu
	题名	People with more misconceptions about automated vehicles might be more positive toward them
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S136984782200078X">https://www.sciencedirect.com/science/article/pii/S136984782200078X</a>

序号	详细信息	
	关键词	Automated vehicle; Public attitude; Public misconception; Public communication
24	作者	Vanessa Stange, Anne Goralzik, Susanne Ernst, Markus Steimle, Markus Maurer, Mark Vollrath
	题名	Please stop now, automated vehicle! – Passengers aim to avoid risk experiences in interactions with a crossing vulnerable road user at an urban junction
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000699">https://www.sciencedirect.com/science/article/pii/S1369847822000699</a>
	关键词	Highly automated driving; Passenger; Risk perception; Urban mixed traffic; Vulnerable road user; Interaction; Space-sharing conflict; Urban junction
25	作者	David Rodwell, Lyndel Bates, Grégoire S. Larue, Barry Watson, Narelle Haworth
	题名	Parents' self-efficacy and the quality of supervised driving practice they provide for their children
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000754">https://www.sciencedirect.com/science/article/pii/S1369847822000754</a>
	关键词	Mother; Father; Driver education; Driver training; Learner driver; Graduated Driver Licensing, GDL, Teen driver, Novice driver
26	作者	Xiaolu Jia, Claudio Feliciani, Hisashi Murakami, Akihito Nagahama, Daichi Yanagisawa, Katsuhiro Nishinari
	题名	Revisiting the level-of-service framework for pedestrian comfortability: Velocity depicts more accurate perceived congestion than local density
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000730">https://www.sciencedirect.com/science/article/pii/S1369847822000730</a>
	关键词	Pedestrian comfortability; Perceived congestion; Pedestrian level-of-service; Pedestrian velocity; Local density; Fundamental diagram
27	作者	Mark S. Horswill, Andrew Hill, Lisa Buckley, Genevieve Kieseker, Francine Elrose
	题名	An online hazard perception training course reduces heavy braking, speeding, and over-revving rates during everyday driving
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000596">https://www.sciencedirect.com/science/article/pii/S1369847822000596</a>

序号	详细信息	
	关键词	Novice drivers; Young drivers; Hazard perception; Situation awareness; Crash risk; Anticipation; Driving; Randomized control trial; Heavy braking; Speeding; Speed; Dashcams; Event-triggered cameras; GPS trackers
28	作者	Paul Marti, Christophe Jallais, Arnaud Koustana ĩ Anne Guillaume, Franck Mars
	题名	Impact of the driver's visual engagement on situation awareness and takeover quality
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000870">https://www.sciencedirect.com/science/article/pii/S1369847822000870</a>
	关键词	Automated driving; Taker-over request; Human factors; Non-driving task; Situation awareness
29	作者	Nishant Mukund Pawar, Nagendra R. Velaga, Sabyasachee Mishra
	题名	Impact of time pressure on acceleration behavior and crossing decision at the onset of yellow signal
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000572">https://www.sciencedirect.com/science/article/pii/S1369847822000572</a>
	关键词	Acceleration behavior; Crossing decision; Yellow signal; Time pressure; Random forest; Mixed effects multinomial logit model
30	作者	Janina Bindsch älel, Ingo Krems, Andrea Kiesel
	题名	Active vehicle pitch motion for communication in automated driving
	网址	<a href="https://www.sciencedirect.com/science/article/pii/S1369847822000791">https://www.sciencedirect.com/science/article/pii/S1369847822000791</a>
	关键词	Active pitch motions; Automated vehicles; Pedestrian-automation-interaction; Informal communication

说明:

- 1、《我校师生在 Transportation Research Part A、B、C 期刊上的发文情况》部分，数据来源于 <https://www.webofscience.com/>
- 2、《Transportation Research Part 系列期刊介绍》部分中，期刊出版信息、影响因子、发文情况、近一年期刊被引量 TOP20 等数据来源于 <https://jcr.clarivate.com/>
- 3、《Transportation Research Part 系列期刊介绍》部分中，期刊最新收录文章数据来源于 <https://www.sciencedirect.com/>

