

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

2021全球研究前沿推介

Nature Latest Research Articles

国外交通运输工程发展动态关注（一）

综合运输类学术期刊介绍

1
2022





学术图情动态

Library & Information Resources In Academic Trend

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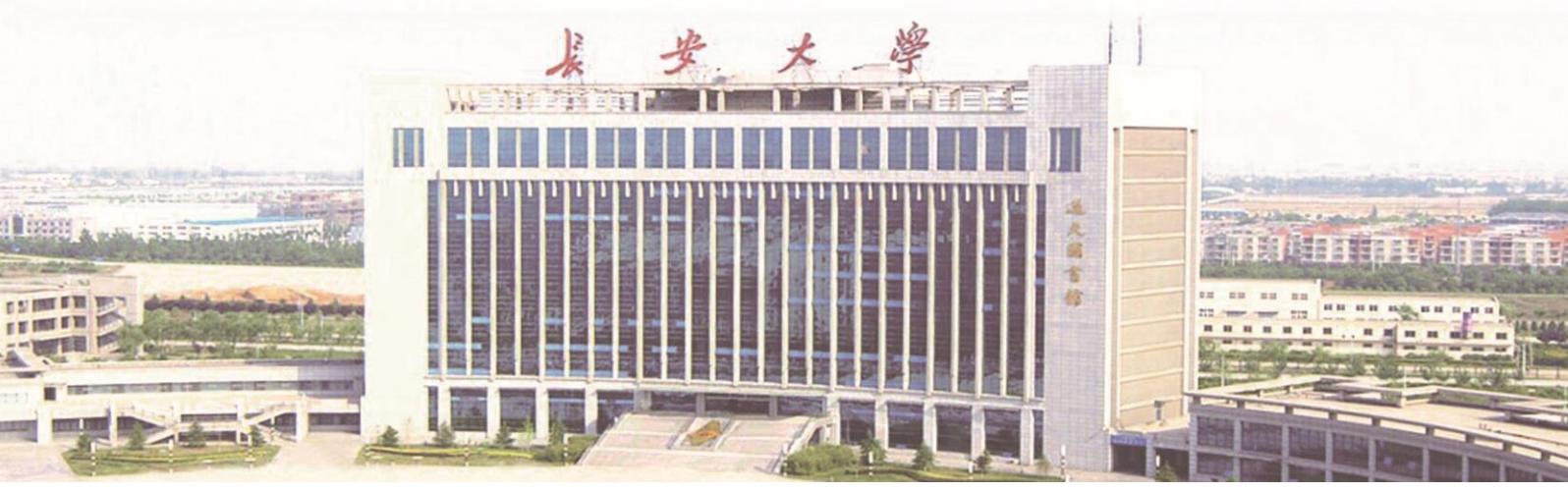
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国外交通运输工程发展动态关注（一）

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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。

数据统计分析：尹 莉，张志惠

审核：史敏鸽

本次数据统计分析时间：2022.3.13

联系电话：029-82339986

2022 年 3 月 10 日，最新一期的 ESI 数据更新，其统计数据覆盖的时间范围为 2011 年 1 月 1 日至 2021 年 12 月 31 日（跨度为十一年）。数据显示本次全球上榜机构总数为 7884 所，相对于 2022 年 1 月公布的数据增加了 176 所；中国上榜机构数为 683 所（大陆 576，台湾 90，香港 14，澳门 3），比 2022 年 1 月增加了 16 所；中国上榜高校数为 438 所（大陆 370，台湾 57，香港 8，澳门 3），比 2022 年 1 月公布的数据增加了 12 所。

与 1 月相比，3 月份各学科新增大陆高校一览如下：

农业科学：北京化工大学、中国药科大学、江西师范大学

生物与生化：湖南农业大学、西北大学、杭州师范大学

化学：上海工程技术大学、大连工业大学、河北农业大学、河南科技大学、苏州科技大学

临床医学：杭州医学院、成都医学院、湖北中医药大学、大连理工大学、河南中医药大学

计算机科学：聊城大学、南昌大学、江苏大学、兰州大学

工程学：中国人民解放军战略支援部队信息工程大学、湖州师范学院、西安石油大学、福建工程学院、大连工业大学、集美大学、西安工业大学、西安邮电大学、上海海洋大学、长春工业大学、浙江科技学院、大连交通大学

环境与生态学：西安理工大学、山东科技大学、成都理工大学、北京建筑大学、安徽农业大学

地球科学：湖南大学、大连理工大学

免疫学：华中农业大学、哈尔滨医科大学

材料科学：南通大学、首都医科大学、重庆理工大学、烟台大学

一般社会科学：上海海事大学、合肥工业大学、大连海事大学、北京林业大学

精神病学心理学：电子科技大学

植物与动物科学：河南科技学院

物理学：西安电子科技大学、武汉理工大学、南方科技大学

药理学与毒物学：湖南中医药大学、滨州医学院、东北农业大学、延边大学

神经科学与行为：深圳大学

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

表 1 2022 年 3 月中国大陆高校 ESI 排名情况

序号	ESI 全球 机构排名	学校名称	进入 ESI 前 1%学科数	论文总数	总被引数	篇均被引	高被引 论文
1	69	北京大学	22	96671	1973100	20.41	1978
2	58	清华大学	21	98941	2140526	21.63	2517
3	74	上海交通大学	21	116608	1931852	16.57	1703
4	79	浙江大学	21	114637	1897168	16.55	1758
5	111	复旦大学	21	78805	1492368	18.94	1385
6	122	中山大学	20	82092	1410720	17.18	1357
7	139	华中科技大学	20	75516	1314121	17.4	1408
8	42	中国科学院大学	19	151653	2458880	16.21	2396
9	197	四川大学	19	73641	1021275	13.87	866
10	209	山东大学	19	68359	988881	14.47	733
11	343	厦门大学	19	36623	650465	17.76	633
12	159	南京大学	18	61386	1230420	20.04	1152
13	203	武汉大学	18	57496	998819	17.37	1128
14	239	吉林大学	18	62636	920441	14.7	663
15	207	中南大学	17	66872	993632	14.86	1087
16	145	中国科学技术大学	16	63242	1280050	20.24	1471
17	226	西安交通大学	16	66055	951122	14.4	893
18	279	同济大学	15	53391	796919	14.93	708
19	282	苏州大学	15	41552	790541	19.03	804
20	336	南开大学	15	32021	668619	20.88	705
21	452	北京师范大学	15	31679	502693	15.87	472
22	464	兰州大学	14	29848	488608	16.37	399
23	519	中国农业大学	14	27757	445654	16.06	418
24	602	华东师范大学	14	23457	376588	16.05	419
25	745	西南大学	14	21484	297736	13.86	224
26	286	天津大学	13	51041	782508	15.33	826
27	317	东南大学	13	50223	728200	14.5	806
28	323	中国医学科学院 北京协和医学院	13	41756	706894	16.93	616
29	433	郑州大学	13	41280	522446	12.66	868
30	485	电子科技大学	13	35857	468444	13.06	816
31	612	深圳大学	13	27461	371562	13.53	573
32	670	暨南大学	13	24857	332006	13.36	299
33	243	哈尔滨工业大学	12	61383	905160	14.75	926
34	344	大连理工大学	12	42379	649563	15.33	534
35	470	重庆大学	12	36214	484586	13.38	555
36	262	华南理工大学	11	44872	836637	18.64	876

序号	ESI 全球 机构排名	学校名称	进入 ESI 前 1%学科数	论文总数	总被引数	篇均被引	高被引 论文
37	400	湖南大学	11	28215	564768	20.02	946
38	418	首都医科大学	11	38772	537696	13.87	361
39	728	华中农业大学	11	18674	306630	16.42	295
40	813	青岛大学	11	20280	262690	12.95	474
41	952	扬州大学	11	17211	215950	12.55	277
42	401	北京航空航天大学	10	40512	564219	13.93	624
43	613	江苏大学	10	26415	370132	14.01	487
44	627	上海大学	10	25938	361169	13.92	381
45	668	南京农业大学	10	21136	332271	15.72	291
46	676	西北农林科技大学	10	23371	329121	14.08	266
47	732	中国人民解放军 海军军医大学	10	16132	304289	18.86	172
48	807	南昌大学	10	20954	265357	12.66	237
49	821	中国海洋大学	10	19692	259417	13.17	223
50	1017	南京师范大学	10	14462	200136	13.84	216
51	1020	西北大学	10	14812	199826	13.49	156
52	1045	华南农业大学	10	14579	194573	13.35	198
53	482	南京医科大学	9	32912	470084	14.28	303
54	684	南方医科大学	9	24123	326225	13.52	216
55	733	江南大学	9	23308	304132	13.05	246
56	1068	华南师范大学	9	15073	191103	12.68	164
57	1099	河海大学	9	18206	186098	10.22	218
58	459	北京理工大学	8	33269	491766	14.78	731
59	484	华东理工大学	8	25189	468784	18.61	362
60	753	中国矿业大学	8	25954	292374	11.27	356
61	803	天津医科大学	8	17845	268643	15.05	156
62	865	中国人民解放军 陆军军医大学	8	13935	241540	17.33	153
63	882	温州医科大学	8	18172	238229	13.11	150
64	905	浙江工业大学	8	17294	231020	13.36	270
65	953	重庆医科大学	8	16262	215505	13.25	115
66	960	华中师范大学	8	10760	212743	19.77	260
67	966	合肥工业大学	8	16433	211377	12.86	190
68	1160	陕西师范大学	8	12891	174113	13.51	171
69	1267	北京林业大学	8	11349	150646	13.27	124
70	1327	山西大学	8	11725	141474	12.07	114
71	1414	杭州师范大学	8	8299	128316	15.46	124
72	474	中国地质大学	7	32280	477497	14.79	467
73	533	西北工业大学	7	34633	434510	12.55	602
74	565	武汉理工大学	7	20368	396351	19.46	510
75	634	中国石油大学	7	27905	356853	12.79	315
76	778	南京航空航天大学	7	24566	280926	11.44	312

序号	ESI 全球 机构排名	学校名称	进入 ESI 前 1%学科数	论文总数	总被引数	篇均被引	高被引 论文
77	820	中国人民解放军 空军军医大学	7	14415	259569	18.011	105
78	830	东华大学	7	14561	254236	17.46	233
79	880	中国医科大学	7	19641	238853	12.16	126
80	920	广州医科大学	7	14627	226149	15.46	197
81	985	南京信息工程大学	7	16262	207304	12.75	335
82	1035	山东第一医科大学	7	15304	195951	12.8	104
83	1167	安徽医科大学	7	13304	172269	12.95	101
84	1199	宁波大学	7	14667	163579	11.15	154
85	1232	山东科技大学	7	12131	157122	12.95	466
86	1263	河南大学	7	11762	150921	12.83	191
87	1369	广西大学	7	12955	136024	10.5	144
88	1418	南通大学	7	11853	128016	10.8	90
89	1453	中国人民大学	7	9180	123715	13.48	135
90	1477	南京林业大学	7	11916	120761	10.13	188
91	1621	福建农林大学	7	8646	107497	12.43	125
92	542	北京科技大学	6	29138	424959	14.58	390
93	560	北京化工大学	6	19610	403333	20.57	426
94	702	南京理工大学	6	23098	318948	13.81	360
95	735	福州大学	6	15937	302864	19	391
96	872	哈尔滨医科大学	6	14827	240683	16.23	148
97	930	西安电子科技大学	6	22367	223730	10	252
98	955	南方科技大学	6	13720	215082	15.68	351
99	969	北京工业大学	6	15969	210438	13.18	181
100	1019	华北电力大学	6	14582	200036	13.72	262
101	1034	西南交通大学	6	18113	197215	10.89	202
102	1062	北京交通大学	6	17704	192569	10.88	198
103	1090	东北师范大学	6	11604	188051	16.21	143
104	1110	济南大学	6	12282	183368	14.93	138
105	1122	中国人民解放军 国防科技大学	6	19511	179458	9.2	134
106	1124	中国药科大学	6	12043	178996	14.86	77
107	1376	昆明理工大学	6	12768	134368	10.52	116
108	1645	广州大学	6	9329	105403	11.3	242
109	1772	东北林业大学	6	8069	95315	11.81	70
110	1795	东北农业大学	6	7995	94202	11.78	140
111	1973	湖南农业大学	6	5584	82204	14.72	108
112	2140	河南科技大学	6	7721	73509	9.52	97
113	714	南京工业大学	5	17956	315283	17.56	313
114	755	东北大学	5	27123	292039	10.77	285
115	1148	广东工业大学	5	13497	175771	13.02	307
116	1225	南京邮电大学	5	10835	158841	14.66	202

序号	ESI 全球 机构排名	学校名称	进入 ESI 前 1%学科数	论文总数	总被引数	篇均被引	高被引 论文
117	1370	浙江师范大学	5	8218	136002	16.55	250
118	1384	安徽大学	5	10897	133852	12.28	149
119	1484	山东师范大学	5	9527	120110	12.61	204
120	1557	大连医科大学	5	8576	112667	13.14	39
121	1587	上海科技大学	5	6221	110541	17.77	195
122	1595	四川农业大学	5	9642	109442	11.35	94
123	1612	汕头大学	5	7927	108236	13.65	98
124	1724	云南大学	5	9566	99065	10.36	69
125	1796	曲阜师范大学	5	7146	94118	13.17	228
126	1800	上海师范大学	5	6826	93871	13.75	102
127	1912	福建师范大学	5	7201	85498	11.87	92
128	1940	长沙理工大学	5	6642	84194	12.68	289
129	2135	浙江农林大学	5	4998	73858	14.78	118
130	2240	海南大学	5	6494	69524	10.71	94
131	2674	浙江工商大学	5	4663	53423	11.46	67
132	1153	哈尔滨工程大学	4	14136	174659	12.36	157
133	1311	北京邮电大学	4	14788	143878	9.73	185
134	1441	湘潭大学	4	8833	125065	14.16	103
135	1475	燕山大学	4	10546	120855	11.46	132
136	1555	上海理工大学	4	10723	112972	10.54	180
137	1567	河南师范大学	4	8706	111606	12.82	114
138	1581	福建医科大学	4	11761	110975	9.44	92
139	1585	广西医科大学	4	8522	110665	12.99	62
140	1617	南京中医药大学	4	8826	107676	12.2	58
141	1673	山东农业大学	4	7855	103625	13.19	77
142	1674	湖南师范大学	4	9345	103421	11.07	92
143	1737	武汉科技大学	4	7504	98063	13.07	107
144	1762	河北医科大学	4	9136	96380	10.55	45
145	1824	天津工业大学	4	8080	91945	11.38	71
146	1825	首都师范大学	4	7451	91909	12.34	63
147	1830	沈阳药科大学	4	6860	91703	13.37	39
148	1834	杭州电子科技大学	4	8997	91485	10.17	125
149	1879	长安大学	4	9951	87390	8.78	126
150	1891	西南石油大学	4	8614	86704	10.07	100
151	1920	齐鲁工业大学	4	8548	85115	9.96	85
152	1928	温州大学	4	5779	84625	14.64	144
153	1961	江西师范大学	4	6074	82881	13.65	61
154	1974	徐州医科大学	4	7113	82122	11.55	36
155	1975	华侨大学	4	6489	82062	12.65	99
156	2075	天津科技大学	4	6351	75898	11.95	47
157	2136	贵州大学	4	8710	73854	8.48	101
158	2180	河南理工大学	4	7146	72053	10.08	131

序号	ESI 全球 机构排名	学校名称	进入 ESI 前 1%学科数	论文总数	总被引数	篇均被引	高被引 论文
159	2303	聊城大学	4	5591	66873	11.96	115
160	2366	华北理工大学	4	4467	64730	14.49	82
161	2385	上海海洋大学	4	6053	64027	10.58	42
162	2415	三峡大学	4	5348	62777	11.74	73
163	2554	石河子大学	4	5655	57501	10.17	22
164	2599	渤海大学	4	3126	55994	17.91	153
165	2664	烟台大学	4	4986	53771	10.78	71
166	2867	广东药科大学	4	4162	47938	11.52	21
167	3141	上海应用技术大学	4	3864	41675	10.79	19
168	1303	太原理工大学	3	12819	145123	11.32	102
169	1312	青岛科技大学	3	10102	143702	14.23	189
170	1559	浙江理工大学	3	8453	112456	13.3	87
171	1743	湖北大学	3	6825	97481	14.28	62
172	1814	常州大学	3	7301	92453	12.66	56
173	1837	上海中医药大学	3	7899	91294	11.56	44
174	1937	江苏师范大学	3	6123	84267	13.76	88
175	1939	河北工业大学	3	8943	84241	9.42	84
176	1954	黑龙江大学	3	4748	83267	17.54	78
177	1991	天津理工大学	3	5566	80837	14.52	102
178	2027	江苏科技大学	3	6732	78333	11.64	118
179	2043	西南科技大学	3	6729	77411	11.5	130
180	2088	武汉工程大学	3	5170	75352	14.57	109
181	2123	河北大学	3	7486	74322	9.93	45
182	2150	西北师范大学	3	6598	73167	11.09	58
183	2165	西安理工大学	3	8093	72476	8.96	108
184	2191	南华大学	3	6078	71764	11.81	72
185	2220	中国计量大学	3	5984	70279	11.74	55
186	2272	陕西科技大学	3	5908	68424	11.58	92
187	2297	新疆大学	3	6620	67058	10.13	55
188	2317	大连海事大学	3	6355	66263	10.43	116
189	2350	安徽工业大学	3	4615	65163	14.12	108
190	2365	兰州理工大学	3	6444	64824	10.06	87
191	2369	西安建筑科技大学	3	6359	64663	10.17	122
192	2427	青岛农业大学	3	5032	62358	12.39	61
193	2569	成都理工大学	3	6479	57075	8.81	56
194	2576	中北大学	3	6297	56834	9.03	75
195	2582	中南民族大学	3	3886	56470	14.53	44
196	2611	安徽农业大学	3	4846	55619	11.48	65
197	2652	河南农业大学	3	5081	54161	10.66	73
198	2656	湖南科技大学	3	4839	54023	11.16	77
199	2698	桂林电子科技大学	3	5513	52631	9.55	69
200	2704	长江大学	3	6113	52308	8.56	67

序号	ESI 全球 机构排名	学校名称	进入 ESI 前 1%学科数	论文总数	总被引数	篇均被引	高被引 论文
201	2738	河南工业大学	3	4339	51272	11.82	39
202	2794	南昌航空大学	3	3666	49836	13.59	57
203	2803	山东理工大学	3	5252	49532	9.43	40
204	2845	内蒙古大学	3	4287	48526	11.32	44
205	2955	郑州轻工业大学	3	3957	45886	11.6	70
206	2958	上海海事大学	3	4498	45768	10.18	83
207	3040	重庆工商大学	3	2545	43910	17.25	84
208	3073	长春理工大学	3	5262	43228	8.22	25
209	3080	西华师范大学	3	2720	43073	15.84	48
210	3111	哈尔滨理工大学	3	4696	42448	9.04	47
211	3161	中南林业科技大学	3	3416	41270	12.08	83
212	3253	湖州师范学院	3	3913	39472	10.09	183
213	3299	江西理工大学	3	3910	38843	9.93	66
214	3342	河北农业大学	3	3599	37958	10.55	29
215	3367	武汉纺织大学	3	2957	37496	12.68	26
216	3397	西南财经大学	3	3840	37046	9.65	137
217	3520	上海工程技术大学	3	4351	34814	8	30
218	3616	上海财经大学	3	3374	33309	9.87	54
219	3636	盐城工学院	3	3031	33019	10.89	32
220	3697	大连工业大学	3	3116	32103	10.3	38
221	3917	西交利物浦大学	3	2656	28872	10.87	51
222	4120	长春工业大学	3	2555	26491	10.37	15
223	4285	中央财经大学	3	2752	24521	8.91	25
224	4500	对外经济贸易大学	3	2384	22094	9.27	59
225	1966	广州中医药大学	2	7539	82653	10.96	40
226	2186	广东医科大学	2	4813	71870	14.93	46
227	2222	北京中医药大学	2	7012	70181	10.01	47
228	2235	安徽师范大学	2	5185	69628	13.43	63
229	2457	昆明医科大学	2	5994	60947	10.17	36
230	2562	山西医科大学	2	5934	57207	9.64	36
231	2627	广西师范大学	2	4752	54917	11.56	43
232	2630	浙江中医药大学	2	5714	54849	9.6	46
233	2690	北京工商大学	2	5277	52832	10.01	81
234	2728	天津师范大学	2	4212	51522	12.23	46
235	2896	桂林理工大学	2	4695	47349	10.08	27
236	2914	河北师范大学	2	4279	46970	10.98	25
237	2932	重庆邮电大学	2	4804	46550	9.69	77
238	2978	西南医科大学	2	4765	45436	9.54	53
239	3037	香港中文大学 (深圳)	2	3129	44008	14.06	69
240	3080	四川师范大学	2	3480	43073	12.38	97
241	3088	宁夏医科大学	2	3498	43029	12.3	30

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242	3104	中国人民解放军 陆军工程大学	2	5115	42608	8.33	34
243	3170	哈尔滨师范大学	2	2676	41128	15.37	51
244	3188	辽宁大学	2	3369	40837	12.12	30
245	3242	上海电力大学	2	2782	39682	14.26	47
246	3256	吉林农业大学	2	4265	39393	9.24	23
247	3276	湖北工业大学	2	3545	39177	11.05	51
248	3306	湖南工业大学	2	2272	38777	17.07	67
249	3325	云南师范大学	2	3112	38318	12.31	62
250	3327	东莞理工学院	2	3178	38238	12.03	57
251	3330	滨州医学院	2	3348	38217	11.41	24
252	3338	沈阳农业大学	2	4168	38075	9.14	25
253	3380	兰州交通大学	2	3501	37317	10.66	60
254	3425	天津中医药大学	2	3449	36506	10.58	16
255	3468	延边大学	2	3242	35855	11	610
256	3505	成都中医药大学	2	4188	35058	8.37	35
257	3564	贵州医科大学	2	3693	34055	9.22	29
258	3612	江西农业大学	2	3291	33340	10.13	26
259	3638	宁波诺丁汉大学	2	2502	33003	13.19	51
260	3645	东华理工大学	2	3299	32937	9.98	22
261	3691	苏州科技大学	2	3335	32137	9.64	53
262	3764	遵义医科大学	2	3670	31067	8.47	9
263	3836	宁夏大学	2	3467	29960	8.64	21
264	3843	辽宁工业大学	2	1394	29847	21.41	99
265	3855	河北科技大学	2	2760	29681	10.75	31
266	3871	锦州医科大学	2	2634	29488	11.2	11
267	4003	吉林师范大学	2	2539	27714	10.92	33
268	4017	山西农业大学	2	2966	27561	9.29	19
269	4030	浙江海洋大学	2	2700	27407	10.15	23
270	4066	重庆理工大学	2	2863	27000	9.43	17
271	4157	集美大学	2	2882	26047	9.04	28
272	4297	内蒙古农业大学	2	2782	24429	8.78	13
273	4327	江西财经	2	2068	24085	11.65	36
274	4332	黑龙江中医药大学	2	1813	23989	13.23	6
275	4386	北京建筑大学	2	2242	23366	10.42	27
276	4417	辽宁石油化工大学	2	2304	23118	10.03	17
277	4472	南京财经大学	2	2172	22421	10.32	40
278	4485	西安工业大学	2	2802	22313	7.96	38
279	4502	河南科技学院	2	2379	22061	9.27	8
280	4580	沈阳工业大学	2	2641	21129	8	29
281	4601	甘肃农业大学	2	2492	20895	8.38	14
282	4603	湖南中医药大学	2	2036	20894	10.26	17

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283	4813	闽江学院	2	1924	18780	9.76	33
284	4847	浙江财经大学	2	1919	18492	9.64	22
285	5265	山东财经大学	2	1549	15307	9.88	30
286	2822	新疆医科大学	1	4708	49148	10.44	34
287	2864	新乡医学院	1	4428	47990	10.84	16
288	2956	湖北医药学院	1	3034	45875	15.12	23
289	3375	淮北师范大学	1	2040	37426	18.35	37
290	3435	西安科技大学	1	4037	36316	9	104
291	3473	鲁东大学	1	3700	35815	9.68	31
292	3541	绍兴文理学院	1	3088	34574	11.2	52
293	3546	嘉兴学院	1	3663	34477	9.41	39
294	3548	重庆师范大学	1	3219	34459	10.7	73
295	3565	信阳师范学院	1	2746	34022	12.39	25
296	3583	安徽理工大学	1	3969	33719	8.5	29
297	3589	台州学院	1	3135	33648	10.73	45
298	3646	辽宁师范大学	1	3534	32920	9.32	27
299	3651	青岛理工大学	1	3263	32855	10.07	109
300	3716	临沂大学	1	3146	31791	10.11	50
301	3724	昆山杜克大学	1	656	31704	48.33	33
302	3739	洛阳师范学院	1	2618	31501	12.03	45
303	3748	佛山科学技术学院	1	3439	31374	9.12	77
304	3774	南阳师范学院	1	1948	30938	15.88	33
305	3780	西安医学院	1	2844	30822	10.84	17
306	3850	济宁医学院	1	2819	29737	10.55	17
307	3870	中国人民解放军 空军工程大学	1	3796	29496	7.77	19
308	3978	潍坊医学院	1	2808	28007	9.97	15
309	4041	武汉轻工大学	1	2150	27268	12.68	26
310	4043	海南医学院	1	2671	27248	10.2	27
311	4045	山东中医药大学	1	2792	27228	9.75	18
312	4125	云南农业大学	1	2398	26418	11.02	27
313	4135	广东海洋大学	1	3073	26272	8.55	26
314	4159	江西科技师范大学	1	2024	26039	12.87	16
315	4170	华东交通大学	1	3257	25866	7.94	51
316	4191	福建中医药大学	1	1914	25649	13.4	2
317	4203	东北石油大学	1	2963	25498	8.61	39
318	4215	安阳师范学院	1	1544	25277	16.37	10
319	4232	大连大学	1	2400	25101	10.46	14
320	4244	蚌埠医学院	1	2542	24957	9.82	15
321	4293	山西师范大学	1	2731	24465	8.96	20
322	4354	内蒙古医科大学	1	2180	23662	10.85	15
323	4390	太原科技大学	1	2788	23324	8.37	31

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324	4404	成都大学	1	2970	23221	7.82	74
325	4440	淮阴工学院	1	2635	22779	8.64	36
326	4471	桂林医学院	1	2103	22432	10.67	14
327	4491	河北工程大学	1	2518	22236	8.83	17
328	4520	重庆交通大学	1	2756	21814	7.92	31
329	4521	沈阳航空航天大学	1	2169	21809	10.05	25
330	4541	皖南医学院	1	2205	21583	9.79	13
331	4556	西华大学	1	2814	21466	7.63	22
332	4579	湖北理工学院	1	983	21133	21.5	10
333	4758	华北水利水电大学	1	2934	19269	6.57	15
334	4763	江西中医药大学	1	2342	19251	8.22	17
335	4778	安徽工程大学	1	1966	19140	9.74	28
336	4889	沈阳化工大学	1	1873	18228	9.73	6
337	4902	天津城建大学	1	1724	18055	10.47	15
338	4914	厦门理工学院	1	2120	17981	8.48	19
339	4918	川北医学院	1	2155	17961	8.33	11
340	4935	内蒙古工业大学	1	2504	17807	7.11	8
341	4942	赣南师范大学	1	1506	17741	11.78	22
342	4968	山东建筑大学	1	2516	17560	6.98	21
343	4988	湖北文理学院	1	1546	17451	11.29	18
344	4991	东北电力大学	1	2148	17438	8.12	47
345	5005	中国民航大学	1	2319	17332	7.47	46
346	5046	西安邮电大学	1	2333	17010	7.29	30
347	5071	中南财经政法大学	1	2163	16747	7.74	53
348	5076	广东石油化工学院	1	1491	16711	11.21	32
349	5107	大连海洋大学	1	1785	16404	9.19	7
350	5113	南京工程学院	1	2434	16360	6.72	11
351	5116	成都医学院	1	1697	16346	9.63	12
352	5138	浙江科技学院	1	1949	16174	8.3	17
353	5141	大连交通大学	1	1637	16156	9.87	17
354	5184	东北财经大学	1	1265	15848	12.53	35
355	5220	西安石油大学	1	2548	15584	6.12	18
356	5274	安徽中医药大学	1	1731	15266	8.82	5
357	5284	湖北中医药大学	1	1359	15185	11.17	11
358	5285	河南中医药大学	1	2093	15179	7.25	3
359	5381	中国人民解放军战略支援 部队信息工程大学	1	2481	14315	5.77	10
360	5461	杭州医学院	1	1999	13741	6.87	20
361	5478	大理大学	1	1350	13637	10.1	23
362	5499	福建工程学院	1	1638	13501	8.24	28
363	5505	石家庄铁道大学	1	1901	13444	7.07	9

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364	5530	北方工业大学	1	1778	13293	7.48	14
365	5628	中国人民解放军 海军工程大学	1	1664	12576	7.56	7
366	5671	北京农学院	1	1171	12282	10.49	6
367	5723	北京信息科技大学	1	1983	12029	6.07	15
368	5760	广东外语外贸大学	1	1456	11797	8.1	30
369	5851	上海体育学院	1	1412	11302	8	3
370	6006	沈阳建筑大学	1	1225	10458	8.54	9

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 7884 所，我校位列 1879 位，ESI 全球排位 23.83%（上期为 24.99%），较上期上涨 1.16%，**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 683 所，我校位列 229 位，ESI 中国机构排位 33.53%（上期为 34.78%），较上期上涨 1.25%。

1. 高被引、热点论文概况

本期长安大学共有四个 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)和环境/生态科学（Environment/Ecology）**。本次数据统计覆盖范围内，我校发表的 WOS 论文总数为 9,951，总被引频次为 87,390 次，篇均被引频次为 8.78 次，较上期均有所提升；其中 ESI 高被引论文有 126 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（127 篇）减少 1 篇。

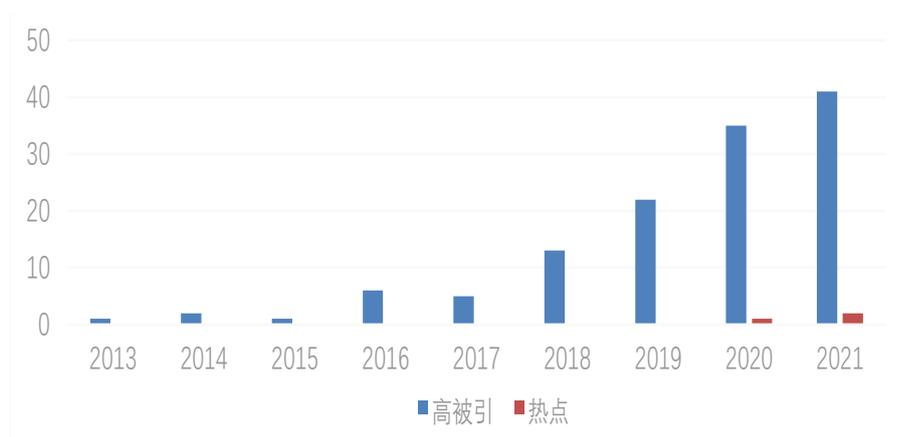


图 1 本期长安大学 ESI 高被引论文、热点论文的年代分布

这些 ESI 高被引论文分布在：工程学领域 42 篇，环境/生态科学领域 34 篇，地球科学领域 12 篇，化学领域 9 篇，社会科学总论 7 篇，经济与商业领域 6 篇，材料科学领域 6 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 85 篇，其中包括作为第一通讯作者发表的 ESI 高被引论文 5 篇，作为合作单位发表的 ESI 高被引论文数为 41 篇。

本期我校 ESI 热点论文有 3 篇（较上期减少 3 篇），均为与其他单位合作发表，热点论文分布在：材料科学领域与 1 篇，社会科学总论 1 篇，经济与商业领域 1 篇（详见本期长安大学 ESI 热点论文索引）。

本期长安大学 ESI 高被引论文、热点论文索引可在长安大学图书馆网站查询（图书馆网址：<https://lib.chd.edu.cn/Default/go?sortID=190>），或联系长安大学参考咨询部查询。

2. 高被引、热点论文的院系分布

本期我校 126 篇 ESI 高被引论文的院系分布情况：水利与环境学院 48 篇（其中第一作者单位论文数 40 篇，合作发表论文数 8 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 19 篇（其中第一作者单位论文数 13 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 5 篇，合作发表论文数 8 篇）；汽车学院 12 篇（其中第一作者单位论文数 11 篇，合作发表论文数 1 篇）；地质工程与测绘学院 9 篇（其中第一作者单位论

文数 2 篇，合作发表论文数 7 篇)；信息工程学院 8 篇 (其中第一作者单位论文数 6 篇，合作发表论文数 2 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 (其中合作发表论文数 2 篇)；建筑学院 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减少 1 篇，总体维持上期水平。其中，汽车学院、材料科学与工程学院、经济与管理学院高被引文章数量均有增加；公路学院、水利与环境学院、工程机械学院、地质工程与测绘学院高被引文章数量略微有所下降。

本期建筑学院首次出现 ESI 高被引论文 (近 20 期)，论文所属 ESI 学科为社会科学总论 (SOCIAL SCIENCES, GENERAL)。

本期我校 ESI 热点论文 3 篇，较上期 6 篇有所减少，具体分布为经济与管理学院 2 篇、水利与环境学院 1 篇，均为合作完成。

我校近 20 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 2 和表 3。

统计方法：表 2、表 3 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 2 近 20 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
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			
2020.7.9	36	38	8	8	8	3	2	4	2	3			

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
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	
2022.3.10	19	48	12	8	9	7	2	2	2	13	3		1

表 3 近 20 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						
2020.1.9				1				
2020.3.12						1		
2020.5.14						7		
2020.7.9	5					2		
2020.9.10	1					7		

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
2020.11.24	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
2022.1.13	2		1			2		1
2022.3.10					1	2		

3. 高被引论文作者

在本期 126 篇高被引文章中，85 篇为第一作者发表（包括第一通讯作者）。从 ESI 高被引论文的作者分布来看，共 53 位作者的文章进入各自领域前 1%，比上期减少 2 位；12 位作者 ESI 高被引文章 ≥ 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 4。

表 4 长安大学 ESI 高被引论文作者分布情况

作者	所属学院	高被引文章数
Adimalla, Narsimha	水利与环境学院	9
Li, Peiyue	水利与环境学院	8
Chen, Hao	汽车学院	4
He, Xiaodong	水利与环境学院	4
Wu, Jianhua	水利与环境学院	4
Yu, Zhang	经济与管理学院	3
Chen, Jie	水利与环境学院	2
Li, Ang	公路学院	2
Wang, Chaohui	公路学院	2
Wang, Zhichao	公路学院	2
Zhao, Xuan	汽车学院	2
Zhu, Qi	水利与环境学院	2
Chen, Qian	公路学院	1
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
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, Yajie	材料科学与工程学院	1
He, Jiaojie	建筑工程学院	1
He, Siyue	公路学院	1

作者	所属学院	高被引文章数
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, Yi	经济与管理学院	1
Luo, Pingping	水利与环境学院	1
Ma, Enlin	公路学院	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
Wei, Miaojun	水利与环境学院	1
Weng, Xiaolin	公路学院	1
Xie, Shaobo	汽车学院	1
Xu, Shuoshuo	公路学院	1
Xu, Zhigang	信息工程学院	1
Yu, Kan Hua	建筑学院	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
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, 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 126 篇 ESI 高被引论文的来源期刊进行分析后, 统计了 73 种来源期刊的名称、发文数量和影响因子 (表 5)。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 12 篇; 影响因子最高的期刊为 *APPLIED CATALYSIS B-ENVIRONMENTAL*, 影响因子高达 17.291, 发表的高被引论文有 6 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 126 篇 ESI 高被引论文的 73 种来源期刊的分区占比情况, 其中 Q1 区的占比最高 (71.23%), Q2 区其次, 两个区的占比达 93.15% (上期为 92% 左右), Q3 区占比 6.85%, 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 5 长安大学 ESI 高被引论文的 73 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	12	1561	Q1	11.422	9.981	7.26
HUMAN AND ECOLOGICAL RISK ASSESSMENT	2	6	606	Q1	5.19	3.742	10.23
APPLIED CATALYSIS B-ENVIRONMENTAL	3	6	461	Q1	19.503	17.291	2.28
JOURNAL OF HAZARDOUS MATERIALS	4	4	392	Q1	10.588	10.129	3.43
APPLIED ENERGY	5	3	294	Q1	9.746	9.953	5.71
ENVIRONMENTAL EARTH SCIENCES	6	2	267	Q2	2.784	2.867	19.06
NANO ENERGY	7	2	261	Q1	17.881	17.631	6.265
JOURNAL OF CLEANER PRODUCTION	8	5	257	Q1	9.297	9.444	4.63
ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH	9	2	254	Q2	4.223	4.306	13.78
ENGINEERING GEOLOGY	10	4	231	Q1	6.755	7.138	6.30
CHEMICAL ENGINEERING JOURNAL	11	2	222	Q1	13.273	11.529	3.13
ACS NANO	12	2	195	Q1	15.881	16.207	3.8
SCIENCE OF THE TOTAL ENVIRONMENT	13	2	194	Q1	7.963	7.842	5.59
JOURNAL OF MATERIALS CHEMISTRY A	14	1	188	Q1	12.732	11.995	5.1
ARABIAN JOURNAL OF GEOSCIENCES	15	1	168	Q3	1.827	1.985	23.38
ENVIRONMENTAL GEOCHEMISTRY AND HEALTH	16	3	158	Q1	4.609	4.677	9.63
ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY	16	3	158	Q1	6.291	6.393	7.05

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
TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY	18	3	157	Q1	5.915	6.255	13.47
ENERGY	19	2	156	Q1	7.147	6.845	4.66
GEOCHIMICA ET COSMOCHIMICA ACTA	20	1	154	Q1	5.01	5.497	4.2
MINE WATER AND THE ENVIRONMENT	21	1	133	Q2	2.883	2.725	12.56
CATENA	22	1	122	Q1	5.198	5.594	7.7
SCIENCE BULLETIN	23	1	120	Q1	11.78	7.658	5.58
TRANSPORTATION RESEARCH PART C-EMERGING TECHNOLOGIES	24	1	118	Q1	8.089	8.795	4.36
INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	25	1	113	Q1	8.568	6.715	8.05
GEOMATICS NATURAL HAZARDS & RISK	26	1	109	Q2	3.528	4.008	6.53
APPLIED THERMAL ENGINEERING	26	1	109	Q1	5.295	5.175	6.7
SUSTAINABLE DEVELOPMENT	28	2	108	Q1	6.159	6.427	9.06
APPLIED AND COMPUTATIONAL MATHEMATICS	29	1	104	Q1	3.898	2.752	8.29
MEDITERRANEAN JOURNAL OF MATHEMATICS	30	1	98	Q2	1.4	1.418	16.01
GEOCHEMISTRY	31	2	94	Q3	2.292	2.292	8.22
APPLIED SCIENCES-BASEL	32	1	92	Q2	2.679	2.736	11.85
JOURNAL OF PHYSICAL CHEMISTRY LETTERS	33	1	90	Q1	6.475	7.643	6.28
INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	34	1	88	Q1	3.39	3.789	10.52
TRANSPORTATION RESEARCH PART D-TRANSPORT AND ENVIRONMENT	35	2	82	Q1	5.495	6.229	4.60
KNOWLEDGE-BASED SYSTEMS	36	1	81	Q1	8.038	7.842	4.54
RISK ANALYSIS	37	1	75	Q1	4	4.155	9.57
IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS	37	1	75	Q1	8.236	8.882	7.35
INTERNATIONAL JOURNAL OF GEOMECHANICS	39	1	70	Q2	3.819	3.969	8.83
ENGINEERING WITH COMPUTERS	40	1	68	Q1	7.963	6.544	12.62
INTERNATIONAL JOURNAL OF LOGISTICS-RESEARCH AND APPLICATIONS	41	3	66	Q3	3.821	4.381	12.87
ENERGY STORAGE MATERIALS	42	1	65	Q1	17.789	17.712	2.74
FILOMAT	43	1	60	Q3	0.844	0.95	18.03

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 ENVIRONMENTAL MANAGEMENT	44	1	57	Q1	6.789	6.914	6.29
ENERGY CONVERSION AND MANAGEMENT	45	1	51	Q1	9.709	8.954	4.16
INTERNATIONAL JOURNAL OF IMPACT ENGINEERING	46	1	50	Q1	4.208	4.768	10.3
GEOSCIENCE FRONTIERS	47	1	43	Q1	6.853	6.791	8.89
IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE	47	1	43	Q1	16.389	18.46	3.56
ENGINEERING	47	1	43	Q1	7.553	8.977	15.97
FINITE FIELDS AND THEIR APPLICATIONS	50	1	42	Q1	1.773	1.797	8.28
JOURNAL OF BUILDING ENGINEERING	50	2	42	Q1	5.318	5.146	11.25
IEEE SENSORS JOURNAL	52	1	41	Q2	3.301	3.441	9.2
JOURNAL OF HYDROLOGY	52	1	41	Q1	5.722	6.033	6.03
ENGINEERING FAILURE ANALYSIS	54	2	30	Q2	3.114	3.233	15.15
ROBOTICS AND COMPUTER-INTEGRATED MANUFACTURING	55	1	26	Q1	5.666	5.67	7.96
IEEE INTERNET OF THINGS JOURNAL	56	1	25	Q1	9.471	10.127	8.65
JOURNAL OF THE ENERGY INSTITUTE	57	1	23	Q2	6.186	5.912	12.97
OPERATIONS MANAGEMENT RESEARCH	57	1	23	Q3	2.706	4.633	13.18
COMPUTERS AND GEOTECHNICS	59	1	22	Q1	4.956	5.501	17.51
JOURNAL OF AFFECTIVE DISORDERS	60	1	19	Q1	4.839	5.515	11.51
CHEMOSPHERE	60	1	19	Q1	7.086	6.956	2.24
PLOS ONE	62	1	17	Q2	3.24	3.788	20.8
ACS SUSTAINABLE CHEMISTRY & ENGINEERING	63	1	16	Q1	8.198	8.471	9.74
EMERGING MARKETS FINANCE AND TRADE	63	1	16	Q2	2.315	2.004	18.7
BUSINESS STRATEGY AND THE ENVIRONMENT	65	1	15	Q1	10.302	11.923	7.25
JOURNAL OF MATERIALS IN CIVIL ENGINEERING	65	1	15	Q2	3.266	3.501	14.07
JOURNAL OF CONSTRUCTIONAL STEEL RESEARCH	65	1	15	Q1	3.646	4.047	14.33
MEASUREMENT	68	1	14	Q1	3.927	3.778	3.92
RENEWABLE ENERGY	68	1	14	Q1	8.001	7.435	4.36
ENVIRONMENTAL IMPACT ASSESSMENT REVIEW	70	1	13	Q2	4.549	5.08	4.93
ROCK MECHANICS AND ROCK ENGINEERING	70	1	13	Q1	6.73	7.381	10.78
GEOMECHANICS AND ENGINEERING	70	1	13	Q2	3.223	2.917	16.25
NATURAL HAZARDS	73	1	10	Q2	3.102	3.656	12.24

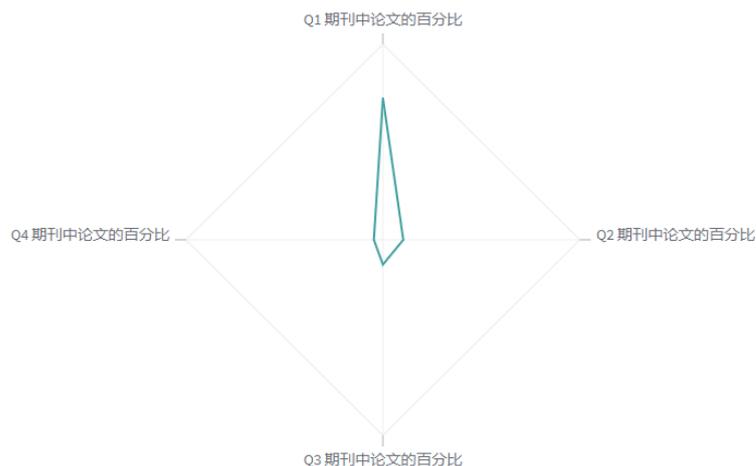


图 2 长安大学 126 篇 ESI 高被引论文来源期刊的影响因子分区占比图

二. 我校 ESI 前 1% 学科概况与优势学科预测

本期我校有四个学科进入 ESI 全球前 1%：工程学、地球科学、材料科学和环境/生态科学。

1. 工程学

本期我校在工程学领域共发表 ESI 论文 3,222 篇（ESI 高被引论文 42 篇），总被引次数为 23,111 次，篇均被引 7.17 次。本期全球有 1,953 所机构（中国机构 378 所）的工程学学科进入 ESI 全球排名前 1% 行列，我校位列 433 位（在中国机构中位列 88 位），全球排位百分比 22.17%（较上期排位上升 1.06%），**进入全球工程学 ESI 机构排名前千分之三**。表 6 为近 20 期我校工程学 Web of Science 发文量、被引频次以及 ESI 排名情况。

表 6 长安大学工程学发文量、被引频次以及 ESI 排名情况（近 20 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

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
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

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 1,707 篇 (ESI 高被引论文 12 篇)，总被引次数为 15,642 次，篇均被引 9.16 次。本期全球有 900 所机构 (中国机构 92 所) 的地球科学进入 ESI 全球排名前 1% 行列，我校位列 511 位 (中国机构中位列 54 位)，全球排位 56.78% (比上期提升约 2.61%)。进入全球地球科学 ESI 机构排名前千分之六。表 7 为近 15 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 7 长安大学地球科学发文量、被引频次以及 ESI 排名情况 (近 15 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

3. 材料科学

本期我校在材料科学领域共发表 ESI 论文 1,838 篇 (ESI 高被引论文 6 篇), 总被引次数为 17,724 次, 篇均被引 9.64 次。本期全球有 1132 所机构 (中国机构 253 所) 的材料科学进入 ESI 全球排名前 1% 行列, 我校位列 624 位 (中国机构中位列 154 位), 全球排位 55.12% (比上期提升 2.44%)。进入全球材料科学 ESI 机构排名前千分之六。表 8 为近 13 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 8 长安大学材料科学发文量、被引频次以及 ESI 排名情况 (近 13 期数据比较)

序号	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

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 1,066 篇 (ESI 高被引论文 34 篇), 总被引次数为 13,596 次, 篇均被引 12.75 次。本期全球有 1,462 所机构 (中国机构 187 所) 的环境/生态科学进入 ESI 全球排名前 1% 行列, 我校位列 718 位 (中国机构中位列 80 位), 全球排位 49.11% (比上期提升 3.04%)。进入全球环境/生态科学 ESI 机构排名前千分之六。表 9 为近 12 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 9 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 12 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

5. 优势学科分析

表 10 为 2011-2021 年（统计时采用的 Incites 数据库更新时间为 2022.3.4）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，要实现突破需要一定的努力；其他领域研究发文数量和被引频次相对较少。

表 10 长安大学 2011-2021 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	3226	25235	0.992824954	75.11
Materials Science	2	1839	18951	0.829916748	83.74
Geosciences	3	1707	16336	1.017267252	80.73
Environment/Ecology	4	1066	14374	1.400439118	80.86
Chemistry	5	742	8217	1.024875876	86.39
Physics	6	348	2633	0.661933908	80.17
Computer Science	7	303	2113	0.934050165	69.67
Social Sciences, general	8	196	1749	2.310653061	77.04
Mathematics	9	190	860	1.244024211	63.16
Agricultural Sciences	10	69	645	1.286581159	71.01
Biology & Biochemistry	11	47	527	1.435561702	87.23
Economics & Business	12	47	367	2.872665957	72.34
Space Science	13	46	360	0.514319565	86.96
Plant & Animal Science	14	29	249	0.80442069	75.86

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 (%)
Clinical Medicine	15	32	156	0.47565625	65.63
Pharmacology & Toxicology	16	9	156	2.029511111	100
Psychiatry/Psychology	17	26	129	1.331757692	73.08
Microbiology	18	5	110	1.32602	80
Neuroscience & Behavior	19	12	91	0.294366667	66.67
Multidisciplinary	20	11	36	0.176436364	54.55
Immunology	21	3	35	0.7731	100
Molecular Biology & Genetics	22	4	35	0.2123	75

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。

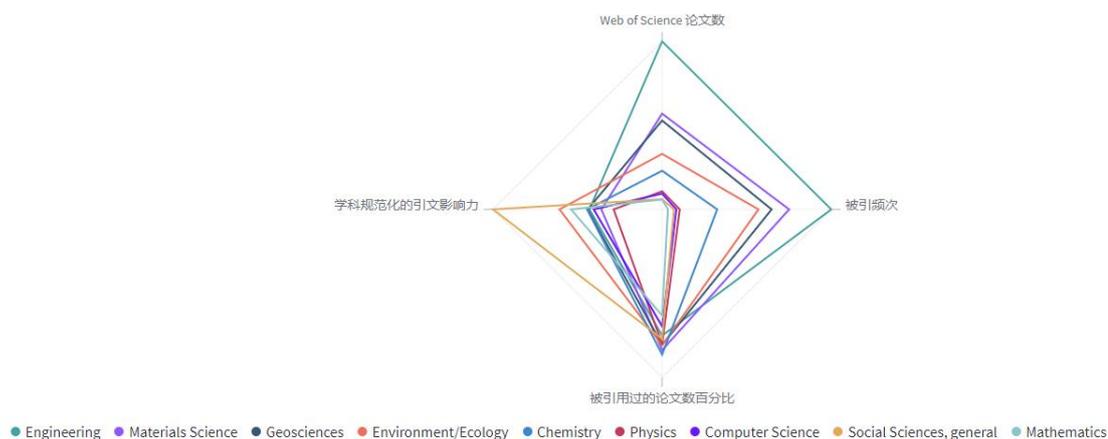
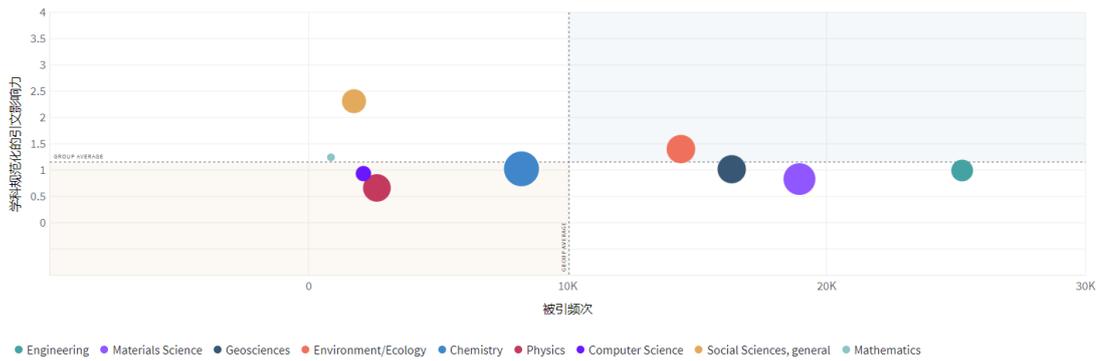


图 3 长安大学发文量前 9 的 ESI 学科发文量、被引频次、CNCI、论文被引百分比的雷达图

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；化学学科的发文章、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 2.87 左右；社会科学总论领域的 CNCI 值也很高，已达 2.31，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 2011-2021 年长安大学发文量 TOP9 的 ESI 学科的 CNCI 值表现情况

6. 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，社会科学总论与 ESI 全球前 1% 的机构阈值接近度已达 97% 左右（比上一期接近度提升约 5% 左右），化学学科与 ESI 全球前 1% 的机构阈值接近度已达 92% 左右（比上一期接近度提升约 5% 左右），这两个学科是我校有望突破 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 44% 左右，也有很大的发展空间。

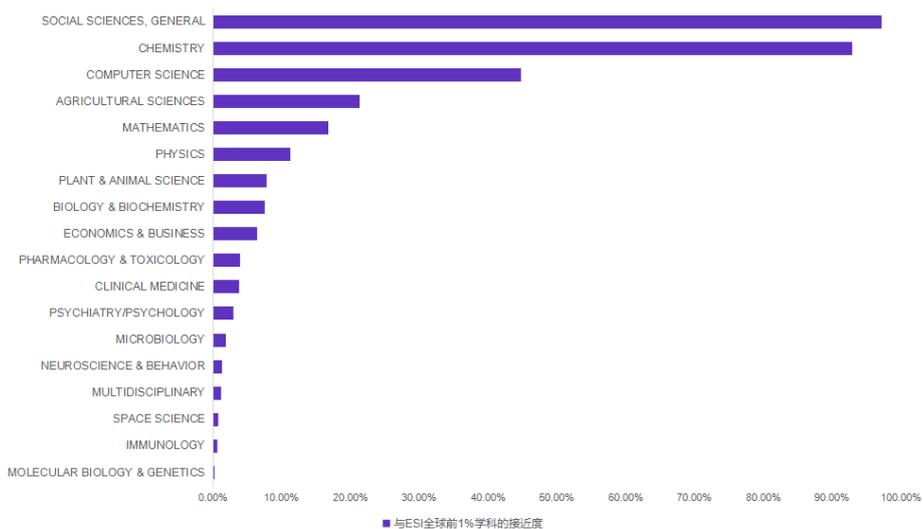


图 5 长安大学具有潜力进入 ESI 全球前 1% 的学科预测情况

注：由于 Incites 数据库与 ESI 数据库更新时间不同步，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.中国科学院科技战略咨询研究院、中国工程院全球工程前沿项目组、中国科学院文献情报中心、科睿唯安公司联合发布的《2021 全球研究前沿》和《2021 全球工程前沿》中涉及我校相关学科的研究前沿推介。

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 3 月份的最新研究论文，以供参考。

本栏目编辑：尹莉 张志惠

一、《2021 全球研究前沿》、《2021 全球工程前沿》推介

1. 交通运输工程相关前沿推介

(1) 基于深度学习的城市交通流量智能预测方法

城市交通流量预测作为智能交通系统的关键使能技术,可为智能出行和动态交通规划提供技术支撑,以缓解道路交通拥堵和方便人们出行,形成智能交通系统的创新型服务。当前城市交通流量预测尚未形成完整的技术体系,存在较多难题需要克服,主要体现在:①道路交通流量数据巨大、信息丰富,具时空复杂性、异质性和稀疏性、难以充分利用;②目前尚缺乏高效的数据驱动预测模型、方法和技术。当前交通流量的智能预测技术主要包括长期预测(时间序列分析)技术以及短期预测(动态实时交通预测)技术,出现了许多基于深度学习技术开展交通流量预测的研究成果:①深度学习模型方面成果包括时间图卷积神经网络(TGCN)、时空融合图深度神经网络、扩散卷积循环神经网络(RNN)、多分枝预测模型等;②深度学习框架方面成果包括时空多任务学习框架、双向长短期记忆(LSTM)人工神经网络、时间信息增强 LSTM 等;③为进一步提高预测能力,还出现了混合深度学习,包括:堆栈式学习者+全连接网络(FCN)、混合卷积神经网络(CNN)+RIIN+注意力机制等。可见,本热点研究得到了研究人员的广泛关注,未来研究将在交通数据时空关系分析、长短期预测技术集成、新型深度学习模型、特定交通场景创新服务等方面展开。

(2) 城市智能客车多模态感知与自主决策技术

随着物联网、大数据、人工智能等新兴技术的快速发展,汽车的智能化水平得到了显著提升,具备高级别自动驾驶功能的汽车正在走向量产应用。自动驾驶的核心关键技术是感知、决策与控制。城市道路的交通环境比高速公路更加复杂,因而需要通过融合多源感知信息,结合机器学习方法实现自主决策。在感知方面,为解决目前单传感器感知技术无法适应复杂城市交通场景的缺陷,需要引入多源感知技术,通过获取车载、路侧与云端数据,有效融合不同传感器对同一目标或场景采集的数据,进而增强感知的可靠性。在决策方面,需要构建自动驾驶大脑,利用机器学习方法开展类人决策,并将控制指令下达给执行机构,实现城市智能客车的自主决策和控制。主要发展趋势包括:充分利用城市交通基础设施,构建

面向客车智能驾驶的数字交通环境和数字孪生平台,实现低延时、高精度的交通信息多元感知;利用云边端一体化技术,研究城市智能驾驶的云决策架构,实现复杂城市交通环境下的多车协同;研究人车路广义交通系统的多尺度场景理解技术,突破自动驾驶在线进化学习技术,实现城市智能客车的自学习。

(3) 自主无人系统智能感知与安全控制

自主无人系统智能感知与安全控制是指自主无人系统对环境的智能识别、理解和认知,以及对自身运动与行为的可靠安全的控制能力。自主无人系统的感知与控制除了稳定性、跟踪性等常规性能指标要求外,还面临着复杂开放环境、随机动态、博弈对抗等新的挑战,从而催生出新的科学难题和技术手段:①复杂开放环境要求自主无人系统具备高精度的态势感知技术,能够应对开放、高动态高密度和大噪声条件下城市场景的实时降噪重建与动态预测难题,现阶段涌现出图像和视频的多层次实例分割、动态障碍物的交互预测、静态环境的实时重建等技术;②随机动态要求自主无人系统具备安全可信的动态运动规划调度技术,能够应对复杂恶劣环境负载多变条件下导航与控制决策的高维数、强实时性难题,现阶段涌现出多传感器紧耦合融合、基于特征学习的视觉定位、路线冲突管理和自动规划控制等算法;③博弈对抗要求自主无人系统具备智能化的协同决策技术,能够应对不确定环境、不完备决策信息、受限制通信情况下多智能体的交互式学习难题,现阶段涌现出多智能体强化学习、生成式对抗网络、分布式鲁棒优化等技术。针对自主无人系统的智能感知与安全控制,下一阶段的重点是构建理论体系、搭建仿真平台、生成测试案例、建立示范工程。

(4) 交通基础设施韧性提升

交通基础设施的韧性是指交通基础设施适应不断变化的外界环境,不断学习和自我调整,抵御各类灾害并快速恢复到正常服役状态,与外界环境的干扰共同进化。交通基础设施的韧性提升被认为是应对气候变化严峻挑战的重要举措之一,提升交通基础设施韧性和降低自然灾害等突发事件对人民交通出行的影响程度已成为交通领域的重大课题。主要研究方向包括:①极端天气条件下交通基础设施恢复能力提升的理论框架;②交通基础设施网络弹性评估与关键节点分析理论;③新型灾害模式下的韧性交通基础设施应急管理策略研究;④韧性交通基础设施的低影响建造与智能维养技术。当前发达国家已将基础设施韧性列为应对气

候变化的下一代交通系统的重要组成部分,将智能化、低碳化、网络化、抗冲击和快速恢复等特性作为关键指标开展重点研究。

(5) 桥梁结构动力多荷载耦合灾变监测和机理分析

桥梁运营过程中受到包括环境风、地脉动、车流、船撞、河流冲刷、泥石流、温度等多种荷载的作用,这些荷载的联合作用会引发桥梁结构发生丰富的动力灾变现象。观测和认识这些灾变行为不但具有实践指导意义而且具有科学价值。近年来的相关研究从单一荷载向多种荷载组合作用发展,主要研究方向包括:①大跨长桥的风车桥耦合振动响应分析和观测;②考虑桥墩冲刷后拱式桥和梁式桥的抗震和船撞安全性分析;③考虑突发地震下高速铁路桥梁行车脱轨安全性和驾乘舒适性分析和监测;④考虑温度荷载的热带亚热带刚构桥抗震风险分析;⑤洪水泥石流下山区桥梁的抗震动力安全性分析。今后的发展趋势是针对在役桥梁监测系统动力灾变涌现现象,认识结构灾变行为的发生机理、相变特征和诱发因素,为桥梁结构的全寿命性能调控和管养维护提供理论指导。

(6) 时速 600km/h 以上高速磁浮基础设施建设技术

高速磁浮基础设施建设技术用于确保时速 600km/h 以上高速磁浮交通系统安全稳定运行,涉及基础设施设计、施工和养护维修等多个方面。目前,时速 600km/h 以上的高速磁浮列车已经下线,但满足工程化要求的中长距离线路基础设施建设技术尚不成熟,直接制约着高速磁浮交通技术的发展,需从基础理论和试验验证两方面开展系统研究。高速磁浮列车与基础设施耦合作用机制是基础设施建设技术的基础理论支撑,涉及结构动力学、电磁控制理论、超导电动磁力作用等多个学科领域。此外,高速磁浮基础设施还面临环境复杂、安全风险大等严峻挑战,而传统轮轨交通基础设施相应的配套技术很难满足要求。主要技术方向包括:①高速磁浮列车-基础设施耦合动力学理论;②高速磁浮列车基础设施综合试验平台;③复杂服役环境下高速磁浮基础设施结构及材料服役性能演化机理及应对措施;④高速磁浮基础设施智能动态检测方法及其养护维修技术。未来主要发展趋势为基础设施建设关键技术中长线工程化验证、高速磁浮列车基础设施长期服役性能及演化规律、基础设施性能智能化检测及监测技术等。

(7) 复杂交通网络韧性监测、评估与优化技术

韧性表征系统对内外部风险的抵御、吸收、自适应和恢复等全周期的应对能

力。交通系统是城市运行系统的重要组成部分,交通网络是承载出行需求的载体,也是重要的生命线系统。《交通强国建设纲要》要求“完善多层次网络布局,优化存量资源配置,增强系统弹性”。城市出行需求强度高,多方式网络耦合强。交通系统内外的扰动和冲击事件频发,经大规模、强关联、多方式网络的传播效应,极易产生区域性、网络化的瘫痪和失效。扰动和冲击事件对网络的影响具有全局性,而现有应对措施具有事后性、局部性。因此,考虑事件对网络全周期的影响,构建韧性交通网络已成为交通工程、城市科学等领域的前沿热点,其核心是实现网络的全局监测、精准评估、协同优化,主要技术方向包括:①海量要素级观测数据的监测部署策略和监测方法、准确及时辨识网络异常状态、触发动态调控机制;②网络韧性精准评估及自恢复力推演技术,提高对异常状态的敏感性、指向性、预判性;③全周期协同优化多方式网络韧性,在事前,设计具有合理冗余、稳健鲁棒的交通网络,在事后,优化多主体恢复资源的时空配置,提升网络恢复能力。针对失效事件难预防、系统演化难预测、事后恢复效率低的难题,需要充分利用大数据、人工智能、物联网等技术,研发大数据和知识融合驱动的复杂交通网络韧性分析与优化技术体系,形成韧性仿真推演与决策评估平台。

(8) 万物互联下的人车路网云融合交通管理研究

融合交通管理是指在物联、大数据、云计算等信息技术的支撑下,对“人、车、路、环境”等交通系统要素进行全时空动态信息采集,并基于人工智能技术,使“信息”发挥其在交通管理中的核心作用,对交通系统中的动、静态要素进行主动的管理与服务,使人和物安全、高效、环保地移动。相较于传统的交通求管理(如拥堵收费、禁限行)和被动的交通控制(如拥堵诱导)手段,万物互联下的人车路网云融合交通管理将通过搜集出行前、中、后的数字化信息,反馈给交通管理系统,从而达到个体出行服务与交通系统最优的目的。当前融合交通管理的主要研究方向是:集聚数据与非集聚数据的采集与融合、移动主体与静态设施的协调与融合、实体系统与虚报系统的孪生与融合、管理控制与个体出行的服务与融合、人类驾驶与自动驾驶车辆的协同与融合。随着汽车产业的自动化、共享化、网联化与电动化,第五代移动通信技术(5G)的推广与普及,人工智能技术的发展完善,交通系统的算据、算法、算力等“三算”要素将进一步充实。交通参与者、运载工具与基础设施的连接程度、智能化水平与交互范围将发生根本

性变革,从而使出行更安全、畅通、环保与人性化,并被普遍认为是彻底解决人类交通问题的方法论所在。

(9) 城市信息模型(CIM)与平台

城市信息模型是以建筑信息模型(BIM)、地理信息系统(GIS)、物联网(IoT)等技术为基础,整合城市地上-地下、室内-室外、历史-现状-未来多维多尺度信息模型数据和城市感知数据,构建起三维数字空间的城市信息有机综合体。CIM平台是三维地理信息系统(3D GIS)、建筑信息模型(BIM)的融合,既可以存储城市规模的海量信息,又可以作为云平台提供协同工作与数据调阅功能。同时和物联网(IoT)、大数据(big data)、云计算(cloud computing)等技术结合起来,还能提供满足城市发展需求的集成性管理系统。CIM平台是利用物联网技术将CIM模型和城市连接起来形成一个可更新的数据库,同时利用云计算和大数据等形成一个可实现信息共享与传递的工作平台,以支持各项应用。此外CIM平台是针对同一个物理空间以及附着在其上的信息形成的由政府组织建设和管理,对居民和企业有选择性地开放,从而解决城市发展进程中的一系列问题的信息平台。CIM包含城市所有设施物理特性和相关信息,可以存储、读取、更新和修改所有城市相关信息。构建一种面向城市治理的智慧城市平台,充分运用物联网、大数据建模、人工智能、3D GIS可视化、BIM、CIM等技术,坚持高起点、全面性、系统性的设计原则,实现立体交通、环境信息、政务服务、经济运行、安全生产、城市基础设施等方面的智慧城市治理,同时建立城市3D GIS模型,叠加城市物联感知数据,融合城市预警形成CIM预警模型,利用人工智能技术实现城市的智慧治理,设计城市运行管理流程,对城市事件进行智能甄别处理,建立智慧城市平台,实现整个城市的智慧治理。

2. 化学与材料科学热点前沿推介

表 1 化学与材料科学 Top10 热点前沿

排名	热点前沿
1	电磁波吸收材料
2	二氧化硫插入策略合成磺酰类功能分子
3	非共价相互作用（卤键、硫键等）
4	无铅储能陶瓷
5	氮杂环卡宾催化
6	基于水凝胶的应变传感器
7	钙钛矿铁电材料
8	化学动力学疗法
9	光电化学生物传感器
10	不对称合成轴手性化合物

3. 地球科学热点前沿推介

表 2 地球科学 Top10 热点前沿

排名	热点前沿
1	基于多种地球系统模型的气候敏感性评估
2	基于数字高程模型的高亚洲冰川质量变化研究
3	华北克拉通金矿床时空演化与构造环境研究
4	基于多个卫星数据的全球火灾排放评估
5	南极洲和格陵兰岛冰量损失对海平面变化的影响
6	基于日光诱导叶绿素荧光卫星数据的植被总初级生产量评估
7	太古代大陆地壳演化与板块构造研究
8	煤中稀土元素地球化学研究
9	全球降水数据集的研制与评估
10	卫星土壤湿度数据产品评估与验证

4. 环境与生态科学热点前沿推介

表 3 生态与环境科学 Top10 热点前沿

排名	热点前沿
1	空气、水体、物体表面等环境中新型冠状病毒的检测与传播
2	新冠肺炎疫情期间的封锁隔离措施对空气质量的影响
3	昆虫衰退现状、灭绝危机与驱动因素
4	燃煤及工业烟气中汞污染的消除
5	微塑料在土壤中的暴露及对土壤生态系统的影响
6	全氟和多氟烷基化合物的分布、暴露、毒理和污染控制技术
7	低成本大气颗粒物传感器性能评估
8	气溶胶与大气边界层相互作用及其对空气质量的影响
9	全球空气污染造成的死亡率和疾病负担估计
10	物种界定方法的改进

二、Nature Latest Research Articles

1. Nature Chemistry

(1) 标题: Cobalt(II)-tetraphenylporphyrin-catalysed carbene transfer from acceptor-acceptor iodonium ylides via N-enolate-carbene radicals

作者: Roel F. J. Epping, Mees M. Hoeksma, Eduard O. Bobylev, Simon Mathew & Bas de Bruin

摘要: Square-planar cobalt(II) systems have emerged as powerful carbene transfer catalysts for the synthesis of numerous (hetero)cyclic compounds via cobalt(III)-carbene radical intermediates. Spectroscopic detection and characterization of reactive carbene radical intermediates is limited to a few scattered experiments, centered around monosubstituted carbenes. Here, we reveal the formation of disubstituted cobalt(III)-carbene radicals derived from a cobalt(II)-tetraphenylporphyrin complex and acceptor-acceptor λ 3-iodaneylidenes (iodonium ylides) as carbene precursors and their catalytic application. Iodonium

ylides generate biscarbenoid species via reversible ligand modification of the paramagnetic cobalt(II)–tetraphenylporphyrin complex catalyst. Two interconnected catalytic cycles are involved in the overall mechanism, with a monocarbene radical and an N-enolate–carbene radical intermediate at the heart of each respective cycle. Notably, N-enolate formation is not a deactivation pathway but a reversible process, enabling transfer of two carbene moieties from a single N-enolate–carbene radical intermediate. The findings are supported by extensive experimental and computational studies.

链接: <https://www.nature.com/articles/s41557-022-00905-4>

(2) 标题: Glory scattering in deeply inelastic molecular collisions

作者: Matthieu Besemer, Guoqiang Tang, Zhi Gao, Ad van der Avoird, Gerrit C. Groenenboom, Sebastiaan Y. T. van de Meerakker & Tijs Karman

摘要: For molecular collisions, the deflection of a molecule’s trajectory provides one of the most sensitive probes of the interaction potential and there are general rules of thumb that relate the direction of deflection to precollision conditions. Following intuition, forward scattering results from glancing collisions, whereas near head-on collisions result in back scattering. Here we present the observation of forward scattering in inelastic processes that defies this common wisdom. For deeply inelastic collisions between NO radicals and CO or HD molecules, we observed forward scattering in fully resolved pair-correlated differential cross-sections, despite the low impact parameters that are needed to induce a sufficient energy transfer. We rationalized these findings by extending the textbook model of hard-sphere scattering—taking inelastic energy transfer into account—and attribute the forward scattering to glory-type trajectories caused by attractive forces. This phenomenon, which we refer to as hard-collision glory scattering, is predicted to be ubiquitous. We derive under which conditions hard-collision glory scattering occurs and retrospectively identify such behaviour in previously studied systems.

链接: <https://www.nature.com/articles/s41557-022-00907-2>

(3) 标题: Reversible C–C bond formation using palladium catalysis

作者: Austin D. Marchese, Bijan Mirabi, Colton E. Johnson & Mark Lautens

摘要: A widely appreciated principle is that all reactions are fundamentally reversible. Observing reversible transition metal-catalysed reactions, particularly those that include the cleavage of C–C bonds, is more challenging. The development of palladium- and nickel-catalysed carboiodination reactions afforded access to the cis and trans diastereomers of the iodo-dihydroisoquinolone products. Using these substrates, an extensive study investigating the reversibility of C–C bond formation using a simple palladium catalyst was undertaken. Herein we report a comprehensive investigation of reversible C–C bond formation using palladium catalysis employing diastereomeric neopentyl iodides as the starting point. It was shown that both diastereomers could be converted to a common product under identical catalytic conditions. A combination of experimental and computational studies were used to probe the operative mechanism. A variety of concepts key to understanding the process of reversible C–C bond formations were investigated, including the effect of electronic and steric parameters on the C–C bond-cleavage step.

链接: <https://www.nature.com/articles/s41557-022-00898-0>

(4) 标题: Insights from an information thermodynamics analysis of a synthetic molecular motor

作者: Shuntaro Amano, Massimiliano Esposito, Elisabeth Kreidt, David A. Leigh, Emanuele Penocchio & Benjamin M. W. Roberts

摘要: Information is physical, a realization that has transformed the physics of measurement and communication. However, the flow between information, energy and mechanics in chemical systems remains largely unexplored. Here we analyse a minimalist autonomous chemically driven molecular motor in terms of information thermodynamics, a framework that quantitatively relates information to other thermodynamic parameters. The treatment reveals how directional motion is generated by free energy transfer from chemical to mechanical (conformational and/or co-conformational) processes by ‘energy flow’ and ‘information flow’. It provides a thermodynamic level of understanding of molecular motors that is general, complements previous analyses based on kinetics and has practical implications for

machine design. In line with kinetic analysis, we find that power strokes do not affect the directionality of chemically driven machines. However, we find that power strokes can modulate motor velocity, the efficiency of free energy transfer and the number of fuel molecules consumed per cycle. This may help explain the role of such (co-)conformational changes in biomachines and illustrates the interplay between energy and information in chemical systems.

链接: <https://www.nature.com/articles/s41557-022-00899-z>

(5) 标题: Porous covalent organic nanotubes and their assembly in loops and toroids

作者: Kalipada Koner, Shayan Karak, Sharath Kandambeth, Suvendu Karak, Neethu Thomas, Luigi Leanza, Claudio Perego, Luca Pesce, Riccardo Capelli, Monika Moun, Monika Bhakar, Thalasseril G. Ajithkumar, Giovanni M. Pavan & Rahul Banerjee

摘要: Carbon nanotubes, and synthetic organic nanotubes more generally, have in recent decades been widely explored for application in electronic devices, energy storage, catalysis and biosensors. Despite noteworthy progress made in the synthesis of nanotubular architectures with well-defined lengths and diameters, purely covalently bonded organic nanotubes have remained somewhat challenging to prepare. Here we report the synthesis of covalently bonded porous organic nanotubes (CONTs) by Schiff base reaction between a tetratopic amine-functionalized triptycene and a linear dialdehyde. The spatial orientation of the functional groups promotes the growth of the framework in one dimension, and the strong covalent bonds between carbon, nitrogen and oxygen impart the resulting CONTs with high thermal and chemical stability. Upon ultrasonication, the CONTs form intertwined structures that go on to coil and form toroidal superstructures. Computational studies give some insight into the effect of the solvent in this assembly process.

链接: <https://www.nature.com/articles/s41557-022-00908-1>

(6) 标题: A 9.2-GHz clock transition in a Lu(II) molecular spin qubit arising from a 3,467-MHz hyperfine interaction

作者: Krishnendu Kundu, Jessica R. K. White, Samuel A. Moehring, Jason M. Yu, Joseph W. Ziller, Filipp Furche, William J. Evans & Stephen Hill

摘要: Spins in molecules are particularly attractive targets for next-generation quantum technologies, enabling chemically programmable qubits and potential for scale-up via self-assembly. Here we report the observation of one of the largest hyperfine interactions for a molecular system, $A_{\text{iso}} = 3,467 \pm 50$ MHz, as well as a very large associated clock transition. This is achieved through chemical control of the degree of *s*-orbital mixing into the spin-bearing *d* orbital associated with a series of spin- $1/2$ La(II) and Lu(II) complexes. Increased *s*-orbital character reduces spin-orbit coupling and enhances the electron-nuclear Fermi contact interaction. Both outcomes are advantageous for quantum applications. The former reduces spin-lattice relaxation, and the latter maximizes the hyperfine interaction, which, in turn, generates a 9-GHz clock transition, leading to an increase in phase memory time from 1.0 ± 0.4 to 12 ± 1 μs for one of the Lu(II) complexes. These findings suggest strategies for the development of molecular quantum technologies, akin to trapped ion systems.

链接: <https://www.nature.com/articles/s41557-022-00894-4>

(7) 标题: Frequency chasing of individual megadalton ions in an Orbitrap analyser improves precision of analysis in single-molecule mass spectrometry

作者: Tobias P. Wörner, Konstantin Aizikov, Joost Snijder, Kyle L. Fort, Alexander A. Makarov & Albert J. R. Heck

摘要: To enhance the performance of charge-detection mass spectrometry, we investigated the behaviour of macromolecular single ions on their paths towards and within the Orbitrap analyser. Ions with a mass beyond one megadalton reach a plateau of stability and can be successfully trapped for seconds, travelling a path length of multiple kilometres, thereby enabling precise mass analysis with an effective resolution of greater than 100,000 at a mass-to-charge ratio of 35,000. Through monitoring the frequency of individual ions, we show that these high-mass ions, rather than being lost from the trap, can gradually lose residual solvent molecules and, in rare cases, a single elementary charge. We also demonstrate that the frequency drift of single ions due to desolvation and charge stripping can be corrected, which improves the effective ion sampling 23-fold and gives a twofold improvement in mass precision and resolution.

链接: <https://www.nature.com/articles/s41557-022-00897-1>

(8) 标题: Quantum–classical simulations of rhodopsin reveal excited-state population splitting and its effects on quantum efficiency

作者: Xuchun Yang, Madushanka Manathunga, Samer Gozem, Jérémie Léonard, Tadeusz Andruniów & Massimo Olivucci

摘要: The activation of rhodopsin, the light-sensitive G-protein-coupled receptor responsible for dim-light vision in vertebrates, is driven by an ultrafast excited-state double-bond isomerization with a quantum efficiency of almost 70%. The origin of such light sensitivity is not understood and a key question is whether in-phase nuclear motion controls the quantum efficiency value. In this study we used hundreds of quantum–classical trajectories to show that, 15 fs after light absorption, a degeneracy between the reactive excited state and a neighbouring state causes the splitting of the rhodopsin population into subpopulations. These subpopulations propagate with different velocities and lead to distinct contributions to the quantum efficiency. We also show here that such splitting is modulated by protein electrostatics, thus linking amino acid sequence variations to quantum efficiency modulation. Finally, we discuss how such a linkage that in principle could be exploited to achieve higher quantum efficiencies would simultaneously increase the receptor thermal noise leading to a trade-off that may have played a role in rhodopsin evolution.

链接: <https://www.nature.com/articles/s41557-022-00892-6>

2. Nature Climate Change

(1) 标题: Different climate response persistence causes warming trend unevenness at continental scales

作者: Qingxiang Li, Bosi Sheng, Jiaying Huang, Chao Li, Zhaoyang Song, Liya Chao, Wenbin Sun, Yang Yang, Boyang Jiao, Ziyu Guo, Longshi Liao, Xuqian Li, Chenglong Sun, Wen Li, Boyin Huang, Wenjie Dong & Phil Jones

摘要: Global warming exhibits distinct differences at continental scales, yet whether models capture these differences is unclear. Here, we show that Coupled Model

Intercomparison Project Phase 6 climate models underestimate warming unevenness for China and the United States, possibly leading to a biased estimation of anthropogenic influence on warming over the two regions. Observational records suggest that the surface air temperature warming trends over China are 1.53 ± 0.10 and 1.38 ± 0.12 times those of the United States for 1900–2017 and 1951–2017, respectively. We find that surface air temperature changes over China seem more sensitive to external forcing owing to stronger long-range persistence, leading to substantially different warming trends between China and the United States. Our study provides insight into the drivers of contemporary climate warming that could help in devising climate change adaptation and mitigation strategies for the future.

链接: <https://www.nature.com/articles/s41558-022-01313-9>

(2) 标题: Imminent loss of climate space for permafrost peatlands in Europe and Western Siberia

作者: Richard E. Fewster, Paul J. Morris, Ruza F. Ivanovic, Graeme T. Swindles, Anna M. Peregón & Christopher J. Smith

摘要: Human-induced climate warming by 2100 is expected to thaw large expanses of northern permafrost peatlands. However, the spatio-temporal dynamics of permafrost peatland thaw remain uncertain due to complex permafrost–climate interactions, the insulating properties of peat soils and variation in model projections of future climate. Here we show that permafrost peatlands in Europe and Western Siberia will soon surpass a climatic tipping point under scenarios of moderate-to-high warming (Shared Socioeconomic Pathway (SSP) 2-4.5, SSP3-7.0 and SSP5-8.5). The total peatland area affected under these scenarios contains 37.0–39.5 Gt carbon (equivalent to twice the amount of carbon stored in European forests). Our bioclimatic models indicate that all of Fennoscandia will become climatically unsuitable for peatland permafrost by 2040. Strong action to reduce emissions (SSP1-2.6) by the 2090s could retain suitable climates for permafrost peatlands storing 13.9 Gt carbon in northernmost Western Siberia, indicating that socio-economic policies will determine the rate and extent of permafrost peatland thaw.

链接: <https://www.nature.com/articles/s41558-022-01296-7>

(3) 标题: Precipitation trends determine future occurrences of compound hot–dry events

作者: Emanuele Bevacqua, Giuseppe Zappa, Flavio Lehner & Jakob Zscheischler

摘要: Compound hot–dry events—co-occurring hot and dry extremes—frequently cause damages to human and natural systems, often exceeding separate impacts from heatwaves and droughts. Strong increases in the occurrence of these events are projected with warming, but associated uncertainties remain large and poorly understood. Here, using climate model large ensembles, we show that mean precipitation trends exclusively modulate the future occurrence of compound hot–dry events over land. This occurs because local warming will be large enough that future droughts will always coincide with at least moderately hot extremes, even in a 2 °C warmer world. By contrast, precipitation trends are often weak and equivocal in sign, depending on the model, region and internal climate variability. Therefore, constraining regional precipitation trends will also constrain future compound hot–dry events. These results help to assess future frequencies of other compound extremes characterized by strongly different trends in the drivers.

链接: <https://www.nature.com/articles/s41558-022-01309-5>

(4) 标题: Achieving Paris climate goals calls for increasing ambition of the Kigali Amendment

作者: Pallav Purohit, Nathan Borgford-Parnell, Zbigniew Klimont & Lena Höglund-Isaksson

摘要: Hydrofluorocarbon emissions have increased rapidly and are managed by the Kigali Amendment to the Montreal Protocol. Yet the current ambition is not consistent with the 1.5 °C Paris Agreement goal. Here, we draw on the Montreal Protocol start-and-strengthen approach to show that accelerated phase-down under the Kigali Amendment could result in additional reductions of 72% in 2050, increasing chances of staying below 1.5 °C throughout this century.

链接: <https://www.nature.com/articles/s41558-022-01310-y>

(5) **标题:** Ageing society in developed countries challenges carbon mitigation

作者: Heran Zheng, Yin Long, Richard Wood, Daniel Moran, Zhengkai Zhang, Jing Meng, Kuishuang Feng, Edgar Hertwich & Dabo Guan

摘要: Populations in developed countries are ageing. However, the impact of senior citizens' consumption on global carbon mitigation is poorly understood. Here we find that senior citizens have played a leading role in driving up GHG emissions in the past decade and are on the way to becoming the largest contributor. Considering the greenhouse gas footprint of household consumption across age groups in 32 developed countries, the senior contribution to national total consumption-based emissions increased from 25.2% to 32.7% between 2005 and 2015. Seniors in the United States and Australia have the highest per capita footprint, twice the Western average. The trend is mainly due to changes in expenditure patterns of seniors. The increasing carbon footprint of senior citizens will probably drive domestic production yet have limited effects on international carbon leakage. The demographic change poses more challenges in local mitigation and calls for deeper public mitigation efforts.

链接: <https://www.nature.com/articles/s41558-022-01302-y>

(6) **标题:** Novel wheat varieties facilitate deep sowing to beat the heat of changing climates

作者: Zhigan Zhao, Enli Wang, John A. Kirkegaard & Greg J. Rebetzke

摘要: Wheat yields are threatened by global warming and unreliable rainfall, which increase heat and drought stress. A potential adaptation strategy is to sow earlier and deeper, taking advantage of stored soil water. However, the short coleoptiles of modern semi-dwarf wheat varieties reduce emergence when sown deep. Novel genotypes with alternative dwarfing genes have longer coleoptiles to facilitate deep sowing, but the yield benefit has been uncertain. We validated new crop simulation routines with field data to assess the impact of novel genotypes on Australian wheat production. We predict that these genotypes, coupled with deep sowing, can increase national wheat yields by 18–20% under historical climate (1901–2020), without increased yield variability, with benefits also projected under future warming. These

benefits are likely to extend to other dryland wheat production regions globally. Our results highlight the impact of synergy between new genetics and management systems to adapt food production to future climates.

链接: <https://www.nature.com/articles/s41558-022-01305-9>

(7) 标题: Pronounced loss of Amazon rainforest resilience since the early 2000s

作者: Chris A. Boulton, Timothy M. Lenton & Niklas Boers

摘要: The resilience of the Amazon rainforest to climate and land-use change is crucial for biodiversity, regional climate and the global carbon cycle. Deforestation and climate change, via increasing dry-season length and drought frequency, may already have pushed the Amazon close to a critical threshold of rainforest dieback. Here, we quantify changes of Amazon resilience by applying established indicators (for example, measuring lag-1 autocorrelation) to remotely sensed vegetation data with a focus on vegetation optical depth (1991–2016). We find that more than three-quarters of the Amazon rainforest has been losing resilience since the early 2000s, consistent with the approach to a critical transition. Resilience is being lost faster in regions with less rainfall and in parts of the rainforest that are closer to human activity. We provide direct empirical evidence that the Amazon rainforest is losing resilience, risking dieback with profound implications for biodiversity, carbon storage and climate change at a global scale.

链接: <https://www.nature.com/articles/s41558-022-01287-8>

(8) 标题: Emergence of climate change in the tropical Pacific

作者: Jun Ying, Matthew Collins, Wenju Cai, Axel Timmermann, Ping Huang, Dake Chen & Karl Stein

摘要: Future changes in the mean climate of the tropical Pacific and characteristics of the El Niño/Southern Oscillation (ENSO) are established as being likely. Determining the time of emergence of climate change signals from the natural variability is critical for mitigation strategies and adaptation planning. Here, using a multimodel ensemble, we find that the annual-mean sea surface temperature (SST) signal has already emerged across much of the tropical Pacific, appearing last in the east. The signal of a wetter annual-mean rainfall in the east is expected to emerge by mid-century, with

some sensitivity to emission scenario. However, the ENSO-related rainfall variability signal is projected to emerge by about 2040 regardless of emission scenario, about 30 years earlier than ENSO-related SST variability signal at about 2070. Our results are instructive for the detection of climate change signals and reinforce the rapidly emerging risks of ENSO-induced climate extremes regardless of mitigation actions.

链接: <https://www.nature.com/articles/s41558-022-01301-z>

(9) 标题: Meta-analyses of fifteen determinants of public opinion about climate change taxes and laws

作者: Magnus Bergquist, Andreas Nilsson, Niklas Haring & Sverker C. Jagers

摘要: Public acceptance is a precondition for implementing taxes and laws aimed at mitigating climate change. However, it still remains challenging to understand its determinants for the climate community. Here, we use a meta-analytic approach to examine the role of public opinion about climate change taxes and laws. Fifteen variables were examined by synthesizing 89 datasets from 51 articles across 33 countries, with a total sample of 119,465 participants. Among all factors, perceived fairness and effectiveness were the most important determinants. Self-enhancement values and knowledge about climate change showed weak relationships and demographic variables showed only weak or close to zero effects. Our meta-analytic results provide useful insights and have the potential to inform climate change researchers, practitioners and policymakers to better design climate policy instruments.

链接: <https://www.nature.com/articles/s41558-022-01297-6>

(10) 标题: Increasing terrestrial ecosystem carbon release in response to autumn cooling and warming

作者: Rui Tang, Bin He, Hans W. Chen, Deliang Chen, Yaning Chen, Yongshuo H. Fu, Wenping Yuan, Baofu Li, Zhi Li, Lanlan Guo, Xingming Hao, Liying Sun, Huiming Liu, Cheng Sun & Yang Yang

摘要: Part of the Northern Hemisphere has experienced widespread autumn cooling during the most recent decades despite overall warming, but how this contrasting temperature change has influenced the ecosystem carbon exchange remains unclear.

Here, we show that autumn cooling has occurred over about half of the area north of 25° N since 2004, producing a weak cooling trend over the period 2004–2018. Multiple lines of evidence suggest an increasing net CO₂ release in autumn during 2004–2018. In cooling areas, the increasing autumn CO₂ release is due to the larger decrease of gross primary productivity (GPP) growth than total ecosystem respiration (TER) growth suppressed by cooling. In the warming areas, TER increased more than GPP because the warming and wetting conditions are more favourable for TER growth than GPP increase. Despite the opposite temperature trends, there has been a systematic increase in ecosystem carbon release across the Northern Hemisphere middle and high latitudes.

链接: <https://www.nature.com/articles/s41558-022-01304-w>

3. Nature Geoscience

(1) 标题: Asymmetry in the seasonal cycle of Antarctic sea ice driven by insolation

作者: L. A. Roach, I. Eisenman, T. J. W. Wagner, E. Blanchard-Wrigglesworth & C. M. Bitz

摘要: The mean seasonal cycle of Antarctic sea-ice extent is asymmetric, with the period of ice retreat being approximately two months shorter than the period of ice advance. This feature is largely consistent in observations from year to year and across different satellite products. The asymmetry is also broadly reproduced by comprehensive climate models across generations from CMIP3 to CMIP6, with limited impacts from internal variability. Using a range of idealized climate models of varying complexity, we show that the seasonal cycle in top-of-atmosphere incident solar radiation drives the asymmetry. Because insolation in southern high latitudes departs from a sinusoid by having a narrow peak of intense brightness in summer and a long period of low light in winter, there is rapid summer ice retreat and gradual winter ice advance. This simple physical explanation is markedly different from those proposed in previous studies.

链接: <https://www.nature.com/articles/s41561-022-00913-6>

(2) 标题: Millennial and centennial CO₂ release from the Southern Ocean during the last deglaciation

作者: Jimin Yu, Delia W. Oppo, Zhangdong Jin, Matthew Lacerra, Xuan Ji, Natalie E. Umling, David C. Lund, Nick McCave, Laurie Menviel, Jun Shao & Chen Xu

摘要: For its greenhouse effects, atmospheric CO₂ can critically influence the global climate on millennial and centennial timescales. Pleistocene atmospheric CO₂ variations must involve changes in ocean storage of carbon, but the mechanisms and pathways of carbon transfer between the oceanic and atmospheric reservoirs are poorly understood due, in part, to complications associated with interpretation of carbonate system proxy data. Here we employ a recently developed approach to reconstruct upper Atlantic air-sea CO₂ exchange signatures through the last deglaciation. Using this approach, proxy and model data each suggest that there was a net release of CO₂ via the Atlantic sector of the Southern Ocean during the early deglaciation, which probably contributed to the millennial-scale atmospheric CO₂ rise during Heinrich Stadial 1 at ~18.0–14.7 kyr ago. Moreover, our data reveal a previously unrecognized mechanism for the centennial-scale atmospheric CO₂ rise at the onset of the Bølling warming event around 14.7 kyr ago, namely, the expansion of Antarctic Intermediate Water, a water mass that is especially inefficient at sequestering atmospheric CO₂. Our findings highlight the role of the Southern Ocean outgassing and intermediate water-mass production and volume variations in governing millennial- and centennial-timescale atmospheric CO₂ rises during the last deglaciation.

链接: <https://www.nature.com/articles/s41561-022-00910-9>

(3) 标题: Slab-derived devolatilization fluids oxidized by subducted metasedimentary rocks

作者: Jay J. Ague, Santiago Tassara, Megan E. Holycross, Ji-Lei Li, Elizabeth Cottrell, Esther M. Schwarzenbach, Charalampos Fassoulas & Timm John

摘要: Metamorphic devolatilization of subducted slabs generates aqueous fluids that ascend into the mantle wedge, driving the partial melting that produces arc magmas.

These magmas have oxygen fugacities some 10–1,000 times higher than magmas generated at mid-ocean ridges. Whether this oxidized magmatic character is imparted by slab fluids or is acquired during ascent and interaction with the surrounding mantle or crust is debated. Here we study the petrology of metasedimentary rocks from two Tertiary Aegean subduction complexes in combination with reactive transport modelling to investigate the oxidative potential of the sedimentary rocks that cover slabs. We find that the metasedimentary rocks preserve evidence for fluid-mediated redox reactions and could be highly oxidized. Furthermore, the modelling demonstrates that layers of these oxidized rocks less than about 200 m thick have the capacity to oxidize the ascending slab dehydration flux via redox reactions that remove H₂, CH₄ and/or H₂S from the fluids. These fluids can then oxidize the overlying mantle wedge at rates comparable to arc magma generation rates, primarily via reactions involving sulfur species. Oxidized metasedimentary rocks need not generate large amounts of fluid themselves but could instead oxidize slab dehydration fluids ascending through them. Proposed Phanerozoic increases in arc magma oxygen fugacity may reflect the recycling of oxidative weathering products following Neoproterozoic–Palaeozoic marine and atmospheric oxygenation.

链接: <https://www.nature.com/articles/s41561-022-00904-7>

(4) 标题: Drought self-propagation in drylands due to land–atmosphere feedbacks

作者: Dominik L. Schumacher, Jessica Keune, Paul Dirmeyer & Diego G. Miralles

摘要: Reduced evaporation due to dry soils can affect the land surface energy balance, with implications for local and downwind precipitation. When evaporation is constrained by soil moisture, the atmospheric supply of water is depleted, and this deficit may propagate in time and space. This mechanism could theoretically result in the self-propagation of droughts, but the extent to which this process occurs is unknown. Here we isolate the influence of soil moisture drought on downwind precipitation using Lagrangian moisture tracking constrained by observations from the 40 largest recent droughts worldwide. We show that dryland droughts are particularly prone to self-propagating because evaporation tends to respond strongly to enhanced soil water stress. In drylands, precipitation can decline by more than 15%

due to upwind drought during a single event and up to 30% during individual months. In light of projected widespread reductions in water availability, this feedback may further exacerbate future droughts.

链接: <https://www.nature.com/articles/s41561-022-00912-7>

(5) 标题: Earth's Great Oxidation Event facilitated by the rise of sedimentary phosphorus recycling

作者: Lewis J. Alcott, Benjamin J. W. Mills, Andrey Bekker & Simon W. Poulton

摘要: The rise of atmospheric oxygen during the Great Oxidation Event some 2.4 billion years ago was a defining transition in the evolution of global biogeochemical cycles and life on Earth. However, mild oxidative continental weathering and the development of ocean oxygen oases occurred several hundred million years before the Great Oxidation Event. The Great Oxidation Event thus represents a tipping point, whereby primary productivity and O₂ production overwhelmed the input of reduced species that consume O₂, and its timing is determined by the input of phosphate, the major limiting nutrient, and the dynamics of the solid Earth. Here, we determine the phase partitioning of phosphorus in 2.65 to 2.43 billion year old drill core samples from the Transvaal Supergroup, South Africa, to investigate the sequence of events that facilitated persistent atmospheric oxygenation. On the basis of the elevated C/P ratios found within sulfidic sediments, relative to the Redfield ratio, we suggest that, as oxidative continental weathering increased the influx of dissolved sulfate and hence dissolved sulfide in the oceans, bioavailable phosphorus became more abundant due to anoxic recycling of sedimentary phosphorus phases. Biogeochemical modelling indicates that this initiated a positive feedback on primary productivity and shows that the evolution of phosphorus recycling may have been a critical step that enabled Earth's transition to a persistently oxygenated atmosphere.

链接: <https://www.nature.com/articles/s41561-022-00906-5>

(6) 标题: Instability of the African large low-shear-wave-velocity province due to its low intrinsic density

作者: Qian Yuan & Mingming Li

摘要: Seismic observations have revealed two seismic anomalies in the lowermost mantle, one beneath Africa and the other beneath the Pacific Ocean, named large low-shear-wave-velocity provinces. These structures are generally considered to be intrinsically dense thermochemical piles that influence mantle and core processes. However, the controls on their morphology, including their relative height difference and their stability, remain unclear. Here we analyse published global shear-wave tomography models, which show that the African anomaly is about 1,000 km greater in height than the Pacific anomaly. With our numerical simulations, we find that the maximum height a thermochemical pile can reach is more controlled by its density and the surrounding mantle viscosity, and less so by its own viscosity and volume. Comparing these findings suggests that the African anomaly has a relatively lower density and thus may be less stable than the Pacific anomaly, implying the two anomalies have different compositions, dynamics and evolution histories.

链接: <https://www.nature.com/articles/s41561-022-00908-3>

(7) **标题:** Surface characteristics of the Zhurong Mars rover traverse at Utopia Planitia

作者: L. Ding, R. Zhou, T. Yu, H. Gao, H. Yang, J. Li, Y. Yuan, C. Liu, J. Wang, Y.-Y. S. Zhao, Z. Wang, Xiyu Wang, G. Bao, Z. Deng, L. Huang, N. Li, X. Cui, X. He, Y. Jia, B. Yuan, G. Liu, H. Zhang, R. Zhao, Z. Zhang, Z. Cheng, F. Wu, Q. Xu, H. Lu, L. Richter, Z. Liu, F. Niu, H. Qi, S. Li, W. Feng, C. Yang, B. Chen, Z. Dang, M. Zhang, L. Li, Xiaoxue Wang, Z. Huang, J. Zhang, H. Xing, G. Wang, L. Niu, P. Xu, W. Wan & K. Di

摘要: China's Mars rover, Zhurong, touched down on Utopia Planitia in the northern lowlands of Mars (109.925° E, 25.066° N) in May 2021, and has been conducting in situ investigations of the landing area in conjunction with the Tianwen-1 orbiter. Here we present surface properties derived from the Zhurong rover's traverse during the first 60 sols of rover operations. Our analysis of the rover's position from locomotion data and camera imagery over that time shows that the rover traversed 450.9 m southwards over a flat surface with mild wheel slippage. Soil parameters determined by terramechanics, which observes wheel-terrain interactions, indicate that the topsoil

has high bearing strength and cohesion. The soil's equivalent stiffness is estimated to range from 1,390 to 5,872 kPa per mN, and the internal friction angle ranges from 21° to 34° under a cohesion of 1.5 to 6 kPa. Aeolian bedforms in the area are primarily transverse aeolian ridges, indicating northeastern local wind directions. Surface rocks imaged by the rover cameras show evidence of physical weathering processes, such as wind erosion, and potential chemical weathering processes. Joint investigations utilizing the scientific payloads of the rover and the orbiter can provide insights into local aeolian and aqueous history, and the habitability evolution of the northern lowlands on Mars.

链接: <https://www.nature.com/articles/s41561-022-00905-6>

(8) 标题: Plate tectonic chain reaction revealed by noise in the Cretaceous quiet zone

作者: Derya Gürer, Roi Granot & Douwe J. J. van Hinsbergen

摘要: Global reorganizations of tectonic plates may be caused by a trigger such as a continental collision or a rising mantle plume. However, whether and how such a trigger propagates through a plate circuit remains unclear. Here we use a plate kinematic model to quantify relative motions between the African and Eurasian plates following a plume-induced plate motion change that triggered formation of a new subduction zone within the Neotethys Ocean at 105 Ma. We constrain the plate kinematic model by geomagnetic intensity variations recorded in Atlantic quiet zone crust that formed during the Cretaceous Normal Superchron (126–83 Ma), during which magnetic reversals were absent. We find that convergence rate changes between Africa and Eurasia are well explained by the initiation and arrest of the plume-induced subduction zone. Our plate kinematic model also reveals that the plate acceleration that followed upon subduction initiation changed the Africa–Eurasia convergence direction, which in turn was accommodated by subsequent subduction initiation about 85 Ma in the Alpine region that then triggered a cascade of regional tectonic events. This plate tectonic chain reaction illustrates how changes in plate motion, underpinned by mantle dynamics, may self-perpetuate through a plate circuit.

链接: <https://www.nature.com/articles/s41561-022-00893-7>

4. Nature Nanotechnology

(1) 标题: Fast and selective reduction of nitroarenes under visible light with an earth-abundant plasmonic photocatalyst

作者: Aby Cheruvathoor Poulouse, Giorgio Zoppellaro, Ioannis Konidakis, Efthymis Serpetzoglou, Emmanuel Stratakis, Ondřej Tomanec, Matthias Beller, Aristides Bakandritsos & Radek Zbořil

摘要: Reduction of nitroaromatics to the corresponding amines is a key process in the fine and bulk chemicals industry to produce polymers, pharmaceuticals, agrochemicals and dyes. However, their effective and selective reduction requires high temperatures and pressurized hydrogen and involves noble metal-based catalysts. Here we report on an earth-abundant, plasmonic nano-photocatalyst, with an excellent reaction rate towards the selective hydrogenation of nitroaromatics. With solar light as the only energy input, the chalcopyrite catalyst operates through the combined action of hot holes and photothermal effects. Ultrafast laser transient absorption and light-induced electron paramagnetic resonance spectroscopies have unveiled the energy matching of the hot holes in the valence band of the catalyst with the frontier orbitals of the hydrogen and electron donor, via a transient coordination intermediate. Consequently, the reusable and sustainable copper-iron-sulfide (CuFeS₂) catalyst delivers previously unattainable turnover frequencies, even in large-scale reactions, while the cost-normalized production rate stands an order of magnitude above the state of the art.

链接: <https://www.nature.com/articles/s41565-022-01087-3>

(2) 标题: Chemical-to-mechanical molecular computation using DNA-based motors with onboard logic

作者: Selma Piranej, Alisina Bazrafshan & Khalid Salaita

摘要: DNA has become the biomolecule of choice for molecular computation that may one day complement conventional silicon-based processors. In general, DNA

computation is conducted in individual tubes, is slow in generating chemical outputs in response to chemical inputs and requires fluorescence readout. Here, we introduce a new paradigm for DNA computation where the chemical input is processed and transduced into a mechanical output using dynamic DNA-based motors operating far from equilibrium. We show that DNA-based motors with onboard logic (DMOLs) can perform Boolean functions (NOT, YES, AND and OR) with 15 min readout times. Because DMOLs are micrometre-sized, massive arrays of DMOLs that are identical or uniquely encoded by size and refractive index can be multiplexed and perform motor-to-motor communication on the same chip. Finally, DMOL computational outputs can be detected using a conventional smartphone camera, thus transducing chemical information into the electronic domain in a facile manner, suggesting potential applications.

链接: <https://www.nature.com/articles/s41565-022-01080-w>

(3) 标题: Phase-change memtransistive synapses for mixed-plasticity neural computations

作者: Syed Ghazi Sarwat, Benedikt Kersting, Timoleon Moraitis, Vara Prasad Jonnalagadda & Abu Sebastian

摘要: In the mammalian nervous system, various synaptic plasticity rules act, either individually or synergistically, over wide-ranging timescales to enable learning and memory formation. Hence, in neuromorphic computing platforms, there is a significant need for artificial synapses that can faithfully express such multi-timescale plasticity mechanisms. Although some plasticity rules have been emulated with elaborate complementary metal oxide semiconductor and memristive circuitry, device-level hardware realizations of long-term and short-term plasticity with tunable dynamics are lacking. Here we introduce a phase-change memtransistive synapse that leverages both the non-volatility of the phase configurations and the volatility of field-effect modulation for implementing tunable plasticities. We show that these mixed-plasticity synapses can enable plasticity rules such as short-term spike-timing-dependent plasticity that helps with the modelling of dynamic environments. Further, we demonstrate the efficacy of the memtransistive synapses in

realizing accelerators for Hopfield neural networks for solving combinatorial optimization problems.

链接: <https://www.nature.com/articles/s41565-022-01095-3>

(4) 标题: Nano-enabled pesticides for sustainable agriculture and global food security

作者: Dengjun Wang, Navid B. Saleh, Andrew Byro, Richard Zepp, Endalkachew Sahle-Demessie, Todd P. Luxton, Kay T. Ho, Robert M. Burgess, Markus Flury, Jason C. White & Chunming Su

摘要: Achieving sustainable agricultural productivity and global food security are two of the biggest challenges of the new millennium. Addressing these challenges requires innovative technologies that can uplift global food production, while minimizing collateral environmental damage and preserving the resilience of agroecosystems against a rapidly changing climate. Nanomaterials with the ability to encapsulate and deliver pesticidal active ingredients (AIs) in a responsive (for example, controlled, targeted and synchronized) manner offer new opportunities to increase pesticidal efficacy and efficiency when compared with conventional pesticides. Here, we provide a comprehensive analysis of the key properties of nanopesticides in controlling agricultural pests for crop enhancement compared with their non-nanoscale analogues. Our analysis shows that when compared with non-nanoscale pesticides, the overall efficacy of nanopesticides against target organisms is 31.5% higher, including an 18.9% increased efficacy in field trials. Notably, the toxicity of nanopesticides toward non-target organisms is 43.1% lower, highlighting a decrease in collateral damage to the environment. The premature loss of AIs prior to reaching target organisms is reduced by 41.4%, paired with a 22.1% lower leaching potential of AIs in soils. Nanopesticides also render other benefits, including enhanced foliar adhesion, improved crop yield and quality, and a responsive nanoscale delivery platform of AIs to mitigate various pressing biotic and abiotic stresses (for example, heat, drought and salinity). Nonetheless, the uncertainties associated with the adverse effects of some nanopesticides are not well-understood, requiring further investigations. Overall, our findings show that nanopesticides are

potentially more efficient, sustainable and resilient with lower adverse environmental impacts than their conventional analogues. These benefits, if harnessed appropriately, can promote higher crop yields and thus contribute towards sustainable agriculture and global food security.

链接: <https://www.nature.com/articles/s41565-022-01082-8>

(5) 标题: A transistor-like pH-sensitive nanodetergent for selective cancer therapy

作者: Mingdong Liu, Liangqi Huang, Weinan Zhang, Xiaochuan Wang, Yuanyuan Geng, Yuhao Zhang, Li Wang, Wenbin Zhang, Yun-Jiao Zhang, Shiyan Xiao, Yan Bao, Menghua Xiong & Jun Wang

摘要: Plasma membrane rupture is a promising strategy for drug-resistant cancer treatment, but its application is limited by the low tumour selectivity of membranolytic molecules. Here we report the design of ‘proton transistor’ nanodetergents that can convert the subtle pH perturbation signals of tumour tissues into sharp transition signals of membranolytic activity for selective cancer therapy. Our top-performing ‘proton transistor’ nanodetergent, P(C6-Bn20), can achieve a >32-fold change in cytotoxicity with a 0.1 pH input signal. At physiological pH, P(C6-Bn20) self-assembles into neutral nanoparticles with inactive membranolytic blocks shielded by poly(ethylene glycol) shells, exhibiting low toxicity. At tumour acidity, a sharp transition in its protonation state induces a morphological transformation and an activation of the membranolytic blocks, and the cation- π interaction facilitates the insertion of benzyl groups-containing hydrophobic domains into the cell membranes, resulting in potent membranolytic activity. P(C6-Bn20) is well tolerated in mice and shows high anti-tumour efficacy in various mouse tumour models.

链接: <https://www.nature.com/articles/s41565-022-01085-5>

(6) 标题: Fully integrated parity-time-symmetric electronics

作者: Weidong Cao, Changqing Wang, Weijian Chen, Song Hu, Hua Wang, Lan Yang & Xuan Zhang

摘要: Harnessing parity-time symmetry with balanced gain and loss profiles has created a variety of opportunities in electronics from wireless energy transfer to

telemetry sensing and topological defect engineering. However, existing implementations often employ ad hoc approaches at low operating frequencies and are unable to accommodate large-scale integration. Here we report a fully integrated realization of parity–time symmetry in a standard complementary metal–oxide–semiconductor process technology. Our work demonstrates salient parity–time symmetry features such as phase transition as well as the ability to manipulate broadband microwave generation and propagation beyond the limitations encountered by existing schemes. The system shows 2.1 times the bandwidth and 30% noise reduction compared to conventional microwave generation in the oscillatory mode, and displays large non-reciprocal microwave transport from 2.75 to 3.10 GHz in the non-oscillatory mode due to enhanced nonlinearities. This approach could enrich integrated circuit design methodology beyond well-established performance limits and enable the use of scalable integrated circuit technology to study topological effects in high-dimensional non-Hermitian systems.

链接: <https://www.nature.com/articles/s41565-021-01038-4>

(7) 标题: Laser-induced nanobubbles safely ablate vitreous opacities in vivo

作者: Félix Sauvage, Van Phuc Nguyen, Yanxiu Li, Aranit Harizaj, J. Sebag, Dimitri Roels, Viktor Van Havere, Karen Peynshaert, Ranhua Xiong, Juan C. Fraire, Marie-José Tassignon, Katrien Remaut, Yannis M. Paulus, Kevin Braeckmans & Stefaan C. De Smedt

摘要: In myopia, diabetes and ageing, fibrous vitreous liquefaction and degeneration is associated with the formation of opacities inside the vitreous body that cast shadows on the retina, appearing as ‘floaters’ to the patient. Vitreous opacities degrade contrast sensitivity function and can cause notable impairment in vision-related quality of life. Here we introduce ‘nanobubble ablation’ for safe destruction of vitreous opacities. Following intravitreal injection, hyaluronic acid-coated gold nanoparticles and indocyanine green, which is widely used as a dye in vitreoretinal surgery, spontaneously accumulate on collagenous vitreous opacities in the eyes of rabbits. Applying nanosecond laser pulses generates vapour nanobubbles that mechanically destroy the opacities in rabbit eyes and in patient

specimens. Nanobubble ablation might offer a safe and efficient treatment to millions of patients suffering from debilitating vitreous opacities and paves the way for a highly safe use of pulsed lasers in the posterior segment of the eye.

链接: <https://www.nature.com/articles/s41565-022-01086-4>

(8) 标题: Nonlinear polariton parametric emission in an atomically thin semiconductor based microcavity

作者: Jiaxin Zhao, Antonio Fieramosca, Ruiqi Bao, Wei Du, Kevin Dini, Rui Su, Jiangang Feng, Yuan Luo, Daniele Sanvitto, Timothy C. H. Liew & Qihua Xiong

摘要: Parametric nonlinear optical processes are at the heart of nonlinear optics underpinning the central role in the generation of entangled photons as well as the realization of coherent optical sources. Exciton-polaritons are capable to sustain parametric scattering at extremely low threshold, offering a readily accessible platform to study bosonic fluids. Recently, two-dimensional transition-metal dichalcogenides (TMDs) have attracted great attention in strong light-matter interactions due to robust excitonic transitions and unique spin-valley degrees of freedom. However, further progress is hindered by the lack of realizations of strong nonlinear effects in TMD polaritons. Here, we demonstrate a realization of nonlinear optical parametric polaritons in a WS₂ monolayer microcavity pumped at the inflection point and triggered in the ground state. We observed the formation of a phase-matched idler state and nonlinear amplification that preserves the valley population and survives up to room temperature. Our results open a new door towards the realization of the future for all-optical valley polariton nonlinear devices.

链接: <https://www.nature.com/articles/s41565-022-01073-9>

(9) 标题: Polarization-sensitive optoionic membranes from chiral plasmonic nanoparticles

作者: iarong Cai, Wei Zhang, Liguang Xu, Changlong Hao, Wei Ma, Maozhong Sun, Xiaoling Wu, Xian Qin, Felipe Mariano Colombari, André Farias de Moura, Jiahui Xu, Mariana Cristina Silva, Evaldo Batista Carneiro-Neto, Weverson Rodrigues Gomes, Renaud A. L. Vallée, Ernesto Chaves Pereira, Xiaogang Liu, Chuanlai Xu, Rafal Klajn, Nicholas A. Kotov & Hua Kuang

摘要: Optoelectronic effects differentiating absorption of right and left circularly polarized photons in thin films of chiral materials are typically prohibitively small for their direct photocurrent observation. Chiral metasurfaces increase the electronic sensitivity to circular polarization, but their out-of-plane architecture entails manufacturing and performance trade-offs. Here, we show that nanoporous thin films of chiral nanoparticles enable high sensitivity to circular polarization due to light-induced polarization-dependent ion accumulation at nanoparticle interfaces. Self-assembled multilayers of gold nanoparticles modified with L-phenylalanine generate a photocurrent under right-handed circularly polarized light as high as 2.41 times higher than under left-handed circularly polarized light. The strong plasmonic coupling between the multiple nanoparticles producing planar chiroplasmonic modes facilitates the ejection of electrons, whose entrapment at the membrane–electrolyte interface is promoted by a thick layer of enantiopure phenylalanine. Demonstrated detection of light ellipticity with equal sensitivity at all incident angles mimics phenomenological aspects of polarization vision in marine animals. The simplicity of self-assembly and sensitivity of polarization detection found in optoionic membranes opens the door to a family of miniaturized fluidic devices for chiral photonics.

链接: <https://www.nature.com/articles/s41565-022-01079-3>

(10) **标题:** Detectivities of WS₂/HfS₂ heterojunctions (Matters Arising)

作者: A. Rogalski

链接: <https://www.nature.com/articles/s41565-022-01076-6>

(11) **标题:** Reply to: Detectivities of WS₂/HfS₂ heterojunctions (Matters Arising)

作者: Steven Lukman, Lu Ding, Lei Xu, Ye Tao, Anders C. Riis-Jensen, Gang Zhang, Qingyang Steve Wu, Ming Yang, Sheng Luo, Chuanghan Hsu, Liangzi Yao, Gengchiao Liang, Hsin Lin, Yong-Wei Zhang, Kristian S. Thygesen, Qi Jie Wang, Yuanping Feng & Jinghua Teng

链接: <https://www.nature.com/articles/s41565-022-01077-5>

(12) **标题:** Precursors of Majorana modes and their length-dependent energy oscillations probed at both ends of atomic Shiba chains

作者: Lucas Schneider, Philip Beck, Jannis Neuhaus-Steinmetz, Levente Rózsa, Thore Posske, Jens Wiebe & Roland Wiesendanger

摘要: Isolated Majorana modes (MMs) are highly non-local quantum states with non-Abelian exchange statistics, which localize at the two ends of finite-size 1D topological superconductors of sufficient length. Experimental evidence for MMs is so far based on the detection of several key signatures: for example, a conductance peak pinned to the Fermi energy or an oscillatory peak splitting in short 1D systems when the MMs overlap. However, most of these key signatures were probed only on one of the ends of the 1D system, and firm evidence for an MM requires the simultaneous detection of all the key signatures on both ends. Here we construct short atomic spin chains on a superconductor—also known as Shiba chains—up to a chain length of 45 atoms using tip-assisted atom manipulation in scanning tunnelling microscopy experiments. We observe zero-energy conductance peaks localized at both ends of the chain that simultaneously split off from the Fermi energy in an oscillatory fashion after altering the chain length. By fitting the parameters of a low-energy model to the data, we find that the peaks are consistent with precursors of MMs that evolve into isolated MMs protected by an estimated topological gap of $50\ \mu\text{eV}$ in chains of at least 35 nm length, corresponding to 70 atoms.

链接: <https://www.nature.com/articles/s41565-022-01078-4>

国外交通运输工程发展动态关注（一）

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。

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。

本栏目编辑：张志惠

一、基于 Web of Science 核心合集发文的推荐名单

以“Transportation” OR “Traffic”为主题检索词在 Web of Science 核心合集中检索，文献类型限定为 Article，时间区间为 2012-2021 年，得到 227,475 条来自 Web of Science 核心合集的结果；其中，高被引与热点文章结果 2,007 条。按照文章所属机构结果从高到低的顺序选取前 15 所院校（研究所/机构单独推荐）；分别得到的推荐关注院校名单如下表 1：

表 1 WOS 核心合集交通研究领域 10 年发文院校推荐表

	核心合集结果	高被引/热点结果
1	UNIVERSITY OF LONDON	HARVARD UNIVERSITY
2	HARVARD UNIVERSITY	UNIVERSITY OF CALIFORNIA BERKELEY
3	UNIVERSITY OF NORTH CAROLINA	UNIVERSITY OF WASHINGTON
4	UNIVERSITY OF TORONTO	MASSACHUSETTS INSTITUTE OF TECHNOLOGY MIT
5	UNIVERSITY OF CALIFORNIA BERKELEY	UNIVERSITY OF LONDON
6	UNIVERSITY OF WASHINGTON	UNIVERSITY OF BRITISH COLUMBIA
7	UNIVERSITY OF MICHIGAN	STANFORD UNIVERSITY
8	MASSACHUSETTS INSTITUTE OF TECHNOLOGY MIT	UNIVERSITY OF CALIFORNIA SAN DIEGO
9	UNIVERSITY COLLEGE LONDON	UNIVERSITY OF WATERLOO
10	UNIVERSITY OF BRITISH COLUMBIA	UNIVERSITY OF MICHIGAN
11	UNIVERSITE DE PARIS	UNIVERSITY OF OXFORD
12	DELFT UNIVERSITY OF TECHNOLOGY	UNIVERSITY OF PENNSYLVANIA

	核心合集结果	高被引/热点结果
13	UNIVERSITY OF TOKYO	UNIVERSITY OF PENNSYLVANIA
14	NATIONAL UNIVERSITY OF SINGAPORE	UNIVERSITY OF CALIFORNIA LOS ANGELES
15	PURDUE UNIVERSITY	IMPERIAL COLLEGE LONDON

其中，UNIVERSITY OF CALIFORNIA BERKELEY，HARVARD UNIVERSITY，MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)，UNIVERSITY OF BRITISH COLUMBIA，UNIVERSITY OF LONDON，UNIVERSITY OF MICHIGAN，UNIVERSITY OF PENNSYLVANIA，UNIVERSITY OF WASHINGTON 这 8 所院校在核心合集发文与高被引/热点发文的表现都较为突出。

二、基于排名机构视角推荐名单

1. 选取参照说明

专业机构排名有很多种，较为著名的有中国软科世界大学学术排名、英国 QS 世界大学排名、英国泰晤士高等教育世界大学排名、美国 U.S. News 等。不同企业、机构对于排名依据、数据来源、各评分细则比重不同，又受到一定程度的主观因素影响。本次报告选取 QS 与软科两个排名机构，列举其近四年顶尖院校名单，选取其中重复出现 3 次以上的部分，作为中外榜单上均广受认可的院校，供师生科研工作参考。

2. QS 世界大学排名

(1) 学科分类差异。国外部分以 QS 世界大学排名较为广泛认可。但交通运输工程学科分类体系存在差异。北美、欧洲、部分亚洲地区专业分类视交通运输工程(Transptation Engineering)为土木工程的分支，常设立于 Department of Civil Engineering。QS 工程学科下子类中“Engineering Civil & Structural (土木工程与

结构)”与交通运输工程重合度最高，作为本次查找依据。

(2) QS 声明的学科 (Subject) 排名指标为:

Academic reputation (基于世界各地 100000 多名学者的受访回应);

Employer reputation (基于来自世界各地毕业生雇主近 50000 份调查问卷);

Research citations per paper (5 年 Scopus 引文数据);

H-index (0%-15%-25% 根据学科出版特征而浮动);

选取过去四年 QS 世界大学名单前 15 名 (含并列) (见表 2), 然后进行计数统计得到四年内至少三次被推荐的院校名单 (见表 4)。

表 2 近四年 QS 世界大学土木工程 Engineering - Civil and Structural 推荐院校

	2021 年	2020 年	2019 年	2018 年
1	Massachusetts Institute of Technology (MIT)	Massachusetts Institute of Technology (MIT)	Massachusetts Institute of Technology (MIT)	Massachusetts Institute of Technology (MIT)
2	National University of Singapore (NUS)	Delft University of Technology Netherlands	National University of Singapore (NUS)	University of Cambridge
3	Delft University of Technology	University of Cambridge United Kingdom	University of California, Berkeley (UCB)	Imperial College London
4	University of California, Berkeley (UCB)	University of California, Berkeley (UCB)	Delft University of Technology	Delft University of Technology Netherlands
5	University of Cambridge	Imperial College London	University of Cambridge	Tsinghua University (Mainland)
6	Imperial College London	ETH Zurich - Swiss Federal Institute of Technology	Imperial College London	National University of Singapore (NUS)
7	Nanyang Technological University, Singapore	Politecnico di Milano	Politecnico di Milano	University of California, Berkeley (UCB)

	2021 年	2020 年	2019 年	2018 年
8	Tsinghua University (Mainland)	Swiss Federal Institute of Technology in Lausanne	ETH Zurich - Swiss Federal Institute of Technology	Stanford University
9	ETH Zurich - Swiss Federal Institute of Technology	National University of Singapore (NUS)	Tsinghua University	Politecnico di Milano
10	Swiss Federal Institute of Technology in Lausanne	Tsinghua University (Mainland)	Nanyang Technological University, Singapore (NTU)	The Hong Kong Polytechnic University
11	Stanford University	The University of New South Wales (UNSW Sydney)	Swiss Federal Institute of Technology in Lausanne	The University of Hong Kong
12	The University of New South Wales (UNSW Sydney)	Nanyang Technological University, Singapore (NTU)	The University of New South Wales (UNSW Sydney)	The University of Tokyo
13	Politecnico di Milano	Stanford University	Stanford University	Kyoto University
14	The University of Sydney	The University of Sydney	Georgia Institute of Technology	Georgia Institute of Technology
15	Georgia Institute of Technology	The University of Melbourne	The Hong Kong Polytechnic University	The University of New South Wales (UNSW Sydney)

3. 软科世界一流学科排名

国内的排名机构以软科影响较大。软科世界一流学科评估采用的指标与权重与 QS 不同，从重要期刊论文数、论文标准化影响力、国际合作论文比例、顶尖期刊论文数、教师获权威奖项数五个指标衡量，其中交通运输工程学科的权重为：

1. 重要期刊论文数（200）；
2. 论文标准化影响力（100）；
3. 国际合作论文比例（20）；

4. 顶尖期刊论文数 (0);

5. 教师获权威奖项数 (0);

本次报告旨在推荐国外值得关注的高校,因此将过去四年里软科世界一流学科排名(交通运输工程)从上到下选 10 名国外院校(见表 3);然后进行计数统计得到四年内至少三次被推荐的院校名单(见表 4)。

表 3 近四年软科交通运输工程专业排名(国外院校部分)

	2021 年	2020 年	2019 年	2018 年
1	代尔夫特理工大学	代尔夫特理工大学	代尔夫特理工大学	代尔夫特理工大学
2	南洋理工大学	南洋理工大学	悉尼大学	加州大学-伯克利
3	滑铁卢大学	麻省理工学院	麻省理工学院	悉尼大学
4	英属哥伦比亚大学	英属哥伦比亚大学	英属哥伦比亚大学	利兹大学
5	悉尼大学	滑铁卢大学	加州大学-伯克利	英属哥伦比亚大学
6	新加坡国立	新加坡国立	滑铁卢大学	麻省理工学院
7	麻省理工学院	利兹大学	利兹大学	滑铁卢大学
8	利兹大学	悉尼大学	新加坡国立	莫纳什大学
9	加州大学-伯克利	加州大学-伯克利	南洋理工大学	昆士兰科技大学
10	佐治亚理工学院	南安普敦大学	南安普敦大学	南安普敦大学

4. QS 与软科共同推荐院校

表 4 的左右两列分别为 QS 和软科两个机构于过去四年内、至少被推荐三次的顶尖院校,其中重合部分为:代尔夫特理工大学(Delft University of Technology),加州大学-伯克利(University of California Berkeley, UCB),麻省理工学院(Massachusetts Institute of Technology, MIT),新加坡国立大学(National

University of Singapore, NUS), 南洋理工大学 (Nanyang Technological University, Singapore), 仅供科研与工作中参考与关注。

表 4 近四年上榜 ≥ 3 次的院校名单

QS	软科
代尔夫特理工大学	代尔夫特理工大学
加州大学-伯克利	加州大学-伯克利
麻省理工学院	麻省理工学院
新加坡国立大学	新加坡国立大学
南洋理工大学	南洋理工大学
剑桥大学	南安普敦大学
伦敦帝国理工学院	滑铁卢大学
米兰理工学院	悉尼大学
斯坦福大学	利兹大学
新南威尔士大学	英属哥伦比亚大学
乔治亚理工学院	
瑞士洛桑联邦理工学	
苏黎世联邦理工	

三、综合推荐关注院校

最后，基于表 1-4 的推荐列表，整理得到推荐关注院校如下：

表 5 综合推荐国外交通运输研究领域关注高校

学校	中文名称
UNIVERSITY OF CALIFORNIA BERKELEY	加州大学伯克利分校
MASSACHUSETTS INSTITUTE OF TECHNOLOGY MIT	麻省理工学院
STANFORD UNIVERSITY	斯坦福大学
UNIVERSITY OF BRITISH COLUMBIA	英属哥伦比亚大学
DELFT UNIVERSITY OF TECHNOLOGY	代尔夫特理工大学
HARVARD UNIVERSITY	哈佛大学
IMPERIAL COLLEGE LONDON	帝国理工学院
NATIONAL UNIVERSITY OF SINGAPORE	新加坡国立大学
UNIVERSITY OF LONDON	伦敦大学
UNIVERSITY OF MICHIGAN	密歇根大学
UNIVERSITY OF PENNSYLVANIA	宾夕法尼亚大学
UNIVERSITY OF WASHINGTON	华盛顿大学
UNIVERSITY OF WATERLOO	滑铁卢大学

本栏目编辑：郭璐 史敏鸽

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。本期先为大家介绍前 3 本期刊。

一、我校师生在 Transportation Research Part A、B、C 期刊上的发文情况

表 1 长安大学在 Transportation Research Part A、B、C 期刊上的发文情况

序号	Author Full Names	Article Title	Source Title	Times Cited, WoS Core	Times Cited, All Databases	Publication Year
1	Gao, Yanan; Rasouli, Soora; Timmermans, Harry; Wang, Yuanqing	Trip stage satisfaction of public transport users: A reference-based model incorporating trip attributes, perceived service quality, psychological disposition and difference tolerance	TRANSPORTATION RESEARCH PART A-POLICY AND PRACTICE	12	12	2018
2	Zhao, Wenjing; Ma, Zhuanglin; Yang, Kui; Huang, Helai; Monsuur, Fredrik; Lee, Jaeyoung	Impacts of variable message signs on en-route route choice behavior		2	2	2020
3	Dong, Chunjiao; Nambisan, Shashi S.; Richards, Stephen H.; Ma, Zhuanglin	Assessment of the effects of highway geometric design features on the frequency of truck involved crashes using bivariate regression		26	27	2015

序号	Author Full Names	Article Title	Source Title	Times Cited, WoS Core	Times Cited, All Databases	Publication Year
4	Zhang, Shihang; Moeckel, Rolf; Moreno, Ana Tsui; Shuai, Bin; Gao, Jie	A work-life conflict perspective on telework		19	20	2020
5	Lu, Qing-Chang	Modeling network resilience of rail transit under operational incidents		41	43	2018
6	Liu, Peng; Xu, Zhigang; Zhao, Xiangmo	Road tests of self-driving vehicles: Affective and cognitive pathways in acceptance formation		30	30	2019
7	Li, Xiaopeng; Ghiasi, Amir; Xu, Zhigang; Qu, Xiaobo	A piecewise trajectory optimization model for connected automated vehicles: Exact optimization algorithm and queue propagation analysis	TRANSPORT ATION RESEARCH PART B-METHOD OLOGICAL	39	41	2018
8	Wang, Jian; Gong, Siyuan; Peeta, Srinivas; Lu, Lili	A real-time deployable model predictive control-based cooperative platooning approach for connected and autonomous vehicles		19	19	2019
9	Ai, Chengbo; Tsai, Yichang James	An automated sign retroreflectivity condition evaluation methodology using mobile LIDAR and computer vision		25	25	2016
10	Zhao, Xiangmo; Wang, Zhen; Xu, Zhigang; Wang, Yu; Li, Xiaopeng; Qu, Xiaobo	Field experiments on longitudinal characteristics of human driver behavior following an autonomous vehicle	TRANSPORT ATION RESEARCH PART C-EMERGIN G TECHNOLO GIES	15	15	2020
11	Wang, Zhen; Shi, Xiaowei; Zhao, Xiangmo; Li, Xiaopeng	Modeling decentralized mandatory lane change for connected and autonomous vehicles: An analytical method		0	0	2021

序号	Author Full Names	Article Title	Source Title	Times Cited, WoS Core	Times Cited, All Databases	Publication Year
12	Mu, Chen; Du, Lili; Zhao, Xiangmo	Event triggered rolling horizon based systematical trajectory planning for merging platoons at mainline-ramp intersection		0	0	2021
13	Liu, Peng; Guo, Qianru; Ren, Fei; Wang, Lin; Xu, Zhigang	Willingness to pay for self-driving vehicles: Influences of demographic and psychological factors		62	68	2019
14	Li, Jinlong; Xu, Zhigang; Fu, Lan; Zhou, Xuesong; Yu, Hongkai	Domain adaptation from daytime to nighttime: A situation-sensitive vehicle detection and traffic flow parameter estimation framework		2	2	2021
15	Ding, Heng; Zhou, Jingwen; Zheng, Xiaoyan; Zhu, Liangyuan; Bai, Haijian; Zhang, Weihua	Perimeter control for congested areas of a large-scale traffic network: A method against state degradation risk		5	5	2020
16	Zhao, Wenjing; Quddus, Mohammed; Huang, Helai; Lee, Jaeyoung; Ma, Zhuanglin	Analyzing drivers' preferences and choices for the content and format of variable message signs (VMS)		19	20	2019
17	Zhao, Xiangmo; Jing, Shoucai; Hui, Fei; Liu, Ronghui; Khattak, Asad J.	DSRC-based rear-end collision warning system - An error-component safety distance model and field test		19	22	2019
18	Chen, Yixin; Quddus, Mohammed; Wang, Xuesong	Impact of combined alignments on lane departure: A simulator study for mountainous freeways		16	19	2018
19	Wang, Chaojie; Gong, Siyuan; Zhou, Anye; Li, Tao; Peeta, Srinivas	Cooperative adaptive cruise control for connected autonomous vehicles by factoring communication-related constraints		34	37	2020

序号	Author Full Names	Article Title	Source Title	Times Cited, WoS Core	Times Cited, All Databases	Publication Year
20	Zhao, Xiangmo; Min, Haigen; Xu, Zhigang; Wang, Wei	An ISVD and SFFSD-based vehicle ego-positioning method and its application on indoor parking guidance		6	7	2019
21	Ding, Heng; Guo, Fang; Zheng, Xiaoyan; Zhang, Weihua	Traffic guidance-perimeter control coupled method for the congestion in a macro network		25	27	2017
22	Wang, Hong-Wei; Peng, Zhong-Ren; Wang, Dongsheng; Meng, Yuan; Wu, Tianlong; Sun, Weili; Lu, Qing-Chang	Evaluation and prediction of transportation resilience under extreme weather events: A diffusion graph convolutional approach		9	9	2020
23	Xu, Zhigang; Zhang, Kaifan; Min, Haigen; Wang, Zhen; Zhao, Xiangmo; Liu, Peng	What drives people to accept automated vehicles? Findings from a field experiment		130	138	2018
24	Wu, Zhouhao; Xie, Jun; Wang, Yuanqing; Nie, Yu (Marco)	Map matching based on multi-layer road index		2	2	2020
25	Qin, Fan; Sun, Rui; Ochieng, Washington Yotto; Feng, Shaojun; Han, Ke; Wang, Yuanqing	Integrated GNSS/DR/road segment information system for variable road user charging		2	2	2017
26	Xu, Zhigang; Jiang, Zijun; Wang, Guanqun; Wang, Runmin; Li, Tingting; Liu, Jinting; Zhang, Yijing; Liu, Peng	When the automated driving system fails: Dynamics of public responses to automated vehicles		2	2	2021

二、Transportation Research Part 系列期刊介绍（一）

1. Transportation Research Part A:Policy and Practice



图 1 PartA 期刊封面

(1) 期刊网址: <http://www.sciencedirect.com/science/journal/09658564>

(2) 期刊介绍:《Transportation Research Part A:Policy and Practice》考虑有关政策分析(设计、制定和评价)、规划、政治、社会经济和物理环境对交通的相互作用以及运输系统管理及评估的论文。研究主题可以从任何学科或角度来探讨:经济学、工程学、心理学、社会学等,但必须有明确的政策关注或实践案例,必须基于真实的研究和高质量的数据。

(3) 出版信息:

ISSN: 0965-8564

EISSN: 1879-2375

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

图 2 PartA 期刊出版信息

(4) JCR 收录情况: 隶属于 TRANSPORTATION – SSCI; ECONOMICS – SSCI; TRANSPORTATION SCIENCE & TECHNOLOGY – SCIE 三个学科,排名分别为:

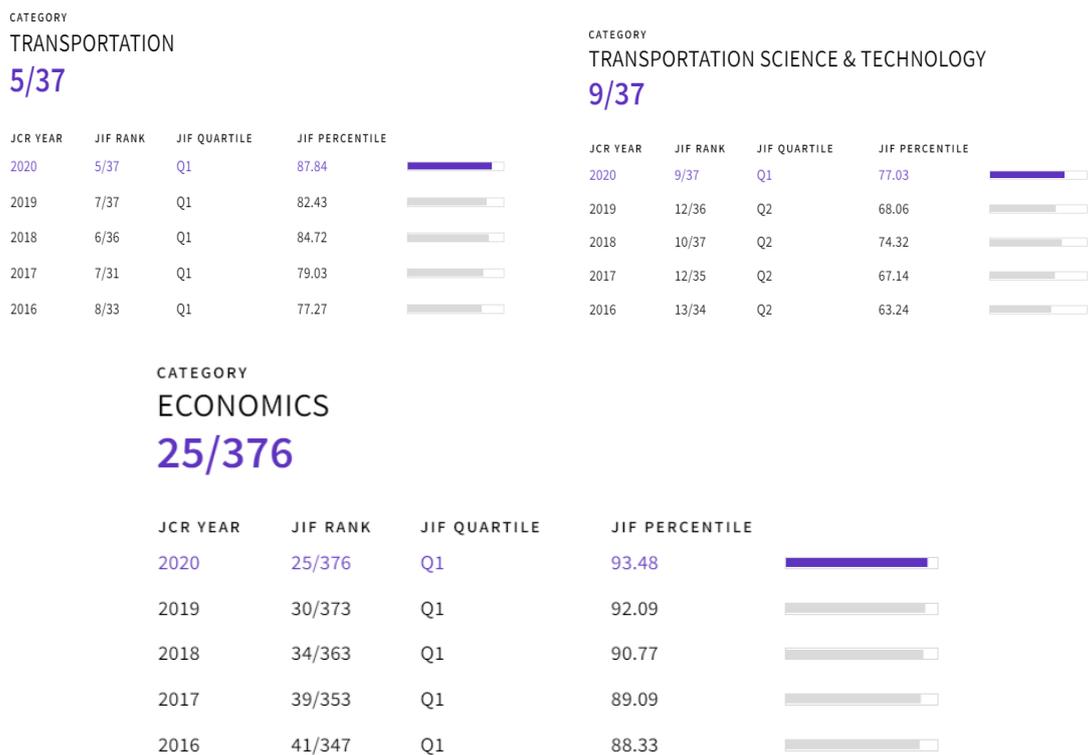


图 3 Part A 期刊分区情况

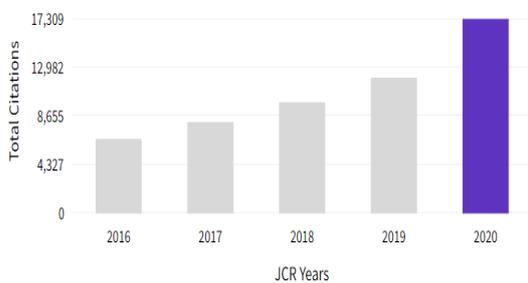


图 4 PartA 期刊总被引量趋势图

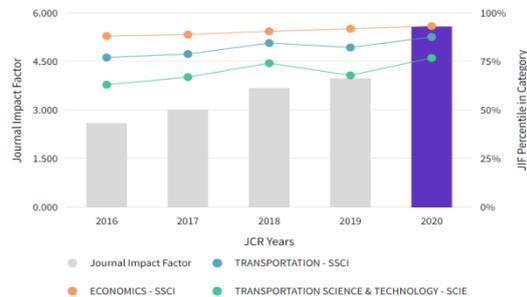


图 5 PartA 期刊隶属学科影响因子趋势图

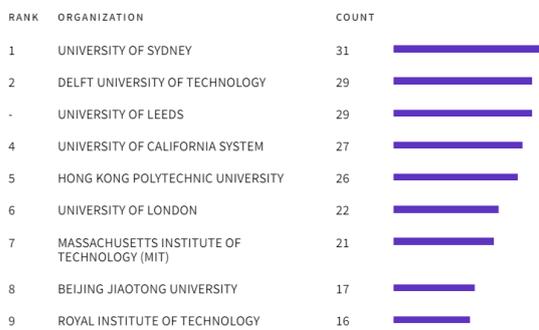


图 6 PartA 期刊发文机构 TOP10

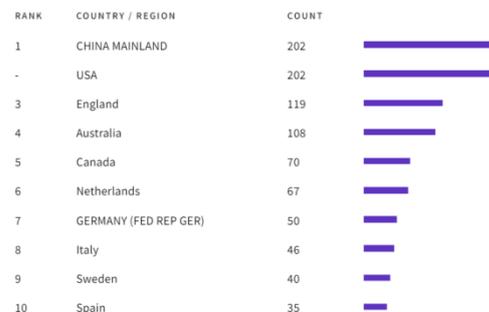


图 7 PartA 期刊发文国家 TOP10

表 2 Part A 期刊被引量 TOP20 文章

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
1	Docherty, Iain; Marsden, Greg; Anable, Jillian	The governance of smart mobility	2018	Article	50
2	Ho, Chinh Q.; Hensher, David A.; Mulley, Corinne; Wong, Yale Z.	Potential uptake and willingness-to-pay for Mobility as a Service (MaaS): A stated choice study	2018	Article	42
3	Biresselioglu, Mehmet Efe; Kaplan, Melike Demirbag; Yilmaz, Barbara Katharina	Electric mobility in Europe: A comprehensive review of motivators and barriers in decision making processes	2018	Review	34
4	Gu, Tianqi; Kim, Inhi; Currie, Graham	To be or not to be dockless: Empirical analysis of dockless bikeshare development in China	2019	Article	34
5	Xu, Wangtu (Ato); Zhou, Jiangping; Yang, Linchuan; Li, Ling	The implications of high-speed rail for Chinese cities: Connectivity and accessibility	2018	Article	31
6	Young, Mischa; Farber, Steven	The who, why, and when of Uber and other ride-hailing trips: An examination of a large sample household travel survey	2019	Article	29
7	Shen, Yu; Zhang, Hongmou; Zhao, Jinhua	Integrating shared autonomous vehicle in public transportation system: A supply-side simulation of the first-mile service in Singapore	2018	Article	29

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
8	Mounce, Richard;Nelson, John D.	On the potential for one-way electric vehicle car-sharing in future mobility systems	2019	Article	28
9	Diao, Mi	Does growth follow the rail? The potential impact of high-speed rail on the economic geography of China	2018	Article	27
10	Zhang, Lei;Qin, Quande	China's new energy vehicle policies: Evolution, comparison and recommendation	2018	Article	24
11	Hudson, John;Orviska, Marta;Hunady, Jan	People's attitudes to autonomous vehicles	2019	Article	24
12	Lavieri, Patricia S.;Bhat, Chandra R.	Modeling individuals' willingness to share trips with strangers in an autonomous vehicle future	2019	Article	23
13	Lyons, Glenn	Getting smart about urban mobility - Aligning the paradigms of smart and sustainable	2018	Article	23
14	Saidi, Samir;Shahbaz, Muhammad;Akhtar, Pervaiz	The long-run relationships between transport energy consumption, transport infrastructure, and economic growth in MENA countries	2018	Article	22
15	Yang, Zhisen;Yang, Zaili;Yin, Jingbo	Realising advanced risk-based port state control inspection using data-driven Bayesian networks	2018	Article	22
16	Malokin, Aliaksandr;Circella, Giovanni;Mokhtarian, Patricia L.	How do activities conducted while commuting influence mode choice? Using revealed preference models to inform public transportation advantage and autonomous vehicle scenarios	2019	Article	22

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
17	Ding, Chuan;Cao, Xinyu (Jason);Naess, Petter	Applying gradient boosting decision trees to examine non-linear effects of the built environment on driving distance in Oslo	2018	Article	21
18	Sun, Daniel(Jian) Daniel(Jian);Ding, Xueqing	Spatiotemporal evolution of ridesourcing markets under the new restriction policy: A case study in Shanghai	2019	Article	20
19	de Almeida Correia, Goncalo Homem;Looff, Erwin;van Cranenburgh, Sander;Snelder, Maaïke;van Arem, Bart	On the impact of vehicle automation on the value of travel time while performing work and leisure activities in a car: Theoretical insights and results from a stated preference survey	2019	Article	19
20	Wang, Kailai;Akar, Gulsah;Chen, Yu-Jen	Bike sharing differences among Millennials, Gen Xers, and Baby Boomers: Lessons learnt from New York City's bike share	2018	Article	19

表 3 PartA 期刊最新收录文章

序号	详细信息	
1	作者	Woojung Kim, Xiaokun Cara Wang,
	题名	The adoption of alternative delivery locations in New York City: Who and how far?,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000349
	关键词	Keywords: Delivery; Online shopping; Alternative delivery location; Delivery locker
2	作者	Andreas Fessler, Mikkel Thorhauge, Stefan Mabit, Sonja Haustein,
	题名	A public transport-based crowdshipping concept as a sustainable last-mile solution: Assessing user preferences with a stated choice experiment,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000337
	关键词	Keywords: Crowdshipping; Last-mile parcel delivery; Discrete choice models; User preferences; Stated choice experiment
3	作者	Ying Lu, Carlo G. Prato, Neil Sipe, Anthony Kimpton, Jonathan Corcoran,
	题名	The role of household modality style in first and last mile travel mode choice,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000313
	关键词	Keywords: First mile; Last mile; Intra-household interactions; Household modality style; Travel mode choice; Latent class nested logit model
4	作者	Kostas Mouratidis, Sebastian Peters,
	题名	COVID-19 impact on teleactivities: Role of built environment and implications for mobility,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000544
	关键词	Keywords: Tele-activity & online activity; Coronavirus disease (COVID-19) pandemic; Internet & digitalization; Travel behavior; Urban form; Sustainable mobility

5	作者	Elias Stapput Knudsen, Katrine Hjorth, Ninette Pilegaard,
	题名	Wages and accessibility – Evidence from Denmark,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000301
	关键词	Keywords: Agglomeration; Productivity; Wider economic benefits; Cost-benefit analysis
6	作者	Fabio Luis Marques dos Santos, Amandine Duboz, Monica Grosso, María Alonso Raposo, Jette Krause, Andromachi Mourtzouchou, Alexandra Balahur, Biagio Ciuffo,
	题名	An acceptance divergence? Media, citizens and policy perspectives on autonomous cars in the European Union,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000477
	关键词	Keywords: Autonomous car; Acceptance; Media analysis; Future mobility
7	作者	Eric Molin, Maarten Kroesen,
	题名	Train travel in corona time: Safety perceptions of and support for policy measures,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000520
	关键词	Keywords: Covid19; Safety perception; Train travel; Transport policy support; Stated choice experiment; Mediation model
8	作者	Abel Rosales-Tristancho, Raúl Brey, Ana F. Carazo, J. Javier Brey,
	题名	Analysis of the barriers to the adoption of zero-emission vehicles in Spain,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000222
	关键词	Keywords: Zero-emission vehicles; Barriers; Cluster analysis; Survey; Spain

9	作者	Saransh Sahu, Ashish Verma,
	题名	Quantifying wider economic impacts of high-speed connectivity and accessibility: The case of the Karnataka high-speed rail,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000453
	关键词	Keywords: High-speed connectivity; Agglomeration economics; High speed Rail; Wider Economic Impacts; Productivity changes; Science city
10	作者	Katherine E. Asmussen, Aupal Mondal, Chandra R. Bhat,
	题名	Adoption of partially automated vehicle technology features and impacts on vehicle miles of travel (VMT),
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000441
	关键词	Keywords: Partially automated vehicles; Vehicle automation; Safety offsets; Vehicle miles of travel (VMT); Psycho-social constructs
11	作者	Garrett Bray, David Cebon,
	题名	Operational speed strategy opportunities for autonomous trucking on highways,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000143
	关键词	Keywords: Heavy goods vehicles; Autonomous trucks; Driverless trucks; Freight value of transport time; Highway speed strategy; Fuel consumption; CO2 emissions
12	作者	Alexandre Sukhov, Lars E. Olsson, Margareta Friman,
	题名	Necessary and sufficient conditions for attractive public Transport: Combined use of PLS-SEM and NCA,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000593
	关键词	Keywords: PLS-SEM; Necessary condition analysis; Service quality; Satisfaction; Public transport

13	作者	Yiyuan Zhang, Xia Luo, Yuansen Qiu, Yuxue Fu,
	题名	Understanding the generation mechanism of BEV drivers' charging demand: An exploration of the relationship between charging choice and complexity of trip chaining patterns,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000350
	关键词	Keywords: Battery electric vehicle; Charging choice; Trip chaining patterns; Recursive simultaneous bivariate probit model; Causal relationships; Latent variable
14	作者	Mark Wardman,
	题名	Meta-analysis of price elasticities of travel demand in great britain: Update and extension,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000283
	关键词	Keywords: Meta-analysis; Transportation price elasticities; Length of long run; Rail demand; Bus demand; Car demand
15	作者	Jaeyong Shin, Nebiyu Tilahun,
	题名	The role of residential choice on the travel behavior of young adults,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856421003013
	关键词	Keywords: Young adults; Travel behavior; Residential location choice; Vehicle ownership; Mode choice; Person miles traveled
16	作者	Wenqing Zhang, Liangliang Liu,
	题名	Exploring non-users' intention to adopt ride-sharing services: Taking into account increased risks due to the COVID-19 pandemic among other factors,
	网址	https://www.sciencedirect.com/science/article/pii/S0965856422000519
	关键词	Keywords: COVID-19; Ambiguity tolerance; Environmental concern; Perceived health threat; Ride-sharing services

2、Transportation Research Part B:Methodological



图 8 PartB 期刊封面

(1) 期刊网址: <http://www.sciencedirect.com/science/journal/01912615>

(2) 期刊介绍:《Transportation Research Part B:Methodological》发表关于交通系统设计和/或分析方面的结合数学模型、方法等分析的论文。涵盖的领域包括:交通流量;交通网络的设计和分析;控制和调度;优化;排队论;后勤;供应链;开发和应用统计、计量经济学和数学模型来解决交通问题;成本模型;定价和/或投资;旅行者或托运人的行为;成本效益方法等。

(3) 出版信息:

ISSN: 0191-2615 EISSN: 1879-2367

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

图 9 PartB 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:

CATEGORY
ECONOMICS
24/376

JCR YEAR	JIF RANK	JIF QUARTILE	JIF PERCENTILE
2020	24/376	Q1	93.75
2019	18/373	Q1	95.31
2018	16/363	Q1	95.73
2017	15/353	Q1	95.89
2016	14/347	Q1	96.11



图 11 PartB 期刊隶属学科影响因子趋势图

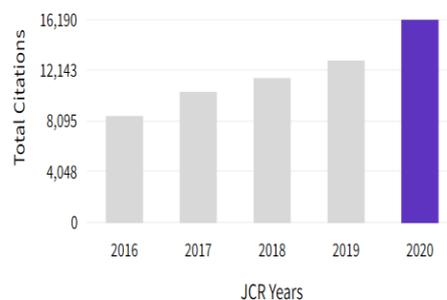


图 12 PartB 期刊总被引量趋势图

RANK	ORGANIZATION	COUNT
1	HONG KONG POLYTECHNIC UNIVERSITY	40
2	BEIJING JIAOTONG UNIVERSITY	31
3	UNIVERSITY OF CALIFORNIA SYSTEM	27
4	HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY	26
5	DELFT UNIVERSITY OF TECHNOLOGY	23
6	UNIVERSITY OF HONG KONG	19
7	BEIHANG UNIVERSITY	18
8	TONGJI UNIVERSITY	16
-	UNIVERSITY OF SYDNEY	16
-	UNIVERSITY SYSTEM OF GEORGIA	16

图 13 PartB 期刊发文机构 TOP10

RANK	COUNTRY / REGION	COUNT
1	CHINA MAINLAND	209
2	USA	203
3	Netherlands	47
4	Australia	43
5	England	40
6	Canada	37
7	Singapore	31
8	Switzerland	25
9	France	21
10	Japan	19

图 14 PartB 期刊发文国家 TOP10

表 4 Part B 期刊被引量 TOP20 文章

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
1	Yu, Chunhui;Feng, Yiheng;Liu, Henry X.;Ma, Wanjing;Yang, Xiaoguang	Integrated optimization of traffic signals and vehicle trajectories at isolated urban intersections	2018	Article	31
2	Ho, Sin C.;Szeto, W. Y.;Kuo, Yong-Hong;Leung, Janny M. Y.;Petering, Matthew;Tou, Terence W. H.	A survey of dial-a-ride problems: Literature review and recent developments	2018	Review	29
3	Haghani, Milad;Sarvi, Majid	Crowd behaviour and motion: Empirical methods	2018	Review	27
4	Wu, Weitiao;Liu, Ronghui;Jin, Wenzhou;Ma, Changxi	Stochastic bus schedule coordination considering demand assignment and rerouting of passengers	2019	Article	26
5	Wang, Yi;Szeto, W. Y.;Han, Ke;Friesz, Terry L.	Dynamic traffic assignment: A review of the methodological advances for environmentally sustainable road transportation applications	2018	Review	24
6	Bhoopalam, Anirudh Kishore;Agatz, Niels;Zuidwijk, Rob	Planning of truck platoons: A literature review and directions for future research	2018	Review	23
7	Xu, Min;Meng, Qiang;Liu, Zhiyuan	Electric vehicle fleet size and trip pricing for one-way carsharing services considering vehicle relocation and personnel assignment	2018	Article	22
8	Wang, Zheng;Sheu, Jiuh-Biing	Vehicle routing problem with drones	2019	Article	21
9	Gong, Siyuan;Du, Lili	Cooperative platoon control for a mixed traffic flow including human drive vehicles and connected and autonomous vehicles	2018	Article	21

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
10	Yildirimoglu, Mehmet;Sirmatel, Isik Ilber;Geroliminis, Nikolas	Hierarchical control of heterogeneous large-scale urban road networks via path assignment and regional route guidance	2018	Article	18
11	Sun, Jie;Zheng, Zuduo;Sun, Jian	Stability analysis methods and their applicability to car-following models in conventional and connected environments	2018	Article	17
12	Szeto, W. Y.;Shui, C. S.	Exact loading and unloading strategies for the static multi-vehicle bike repositioning problem	2018	Article	16
13	Wang, Hai;Yang, Hai	Ridesourcing systems: A framework and review	2019	Review	16
14	Elci, Ozgun;Noyan, Nilay	A chance-constrained two-stage stochastic programming model for humanitarian relief network design	2018	Article	16
15	Wang, Yihui;D'Ariano, Andrea;Yin, Jiateng;Meng, Lingyun;Tang, Tao;Ning, Bin	Passenger demand oriented train scheduling and rolling stock circulation planning for an urban rail transit line	2018	Article	16
16	Di, Zhen;Yang, Lixing;Qi, Jianguo;Gao, Ziyou	Transportation network design for maximizing flow-based accessibility	2018	Article	15
17	Wang, Jian;Peeta, Srinivas;He, Xiaozheng	Multiclass traffic assignment model for mixed traffic flow of human-driven vehicles and connected and autonomous vehicles	2019	Article	15
18	Li, Xiaopeng;Ghiasi, Amir;Xu, Zhigang;Qu, Xiaobo	A piecewise trajectory optimization model for connected automated vehicles: Exact optimization algorithm and queue propagation analysis	2018	Article	15

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
19	Shang, Pan;Li, Ruimin;Guo, Jifu;Xian, Kai;Zhou, Xuesong	Integrating Lagrangian and Eulerian observations for passenger flow state estimation in an urban rail transit network: A space-time-state hyper network-based assignment approach	2019	Article	14
20	Wang, Kun;Zhang, Anming	Climate change, natural disasters and adaptation investments: Inter- and intra-port competition and cooperation	2018	Article	14

表 5 Part B 期刊最新收录文章

序号	详细信息	
1	作者	Yukihiro Kidokoro, Anming Zhang,
	题名	Airport cities and social welfare,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261521002344
	关键词	Keywords: Airport city; Non-aeronautical service; Varieties; Locational rent; Delegation; Airport location
2	作者	Subodh Dubey, Oded Cats, Serge Hoogendoorn, Prateek Bansal,
	题名	A multinomial probit model with Choquet integral and attribute cut-offs,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000261
	关键词	Keywords: Choquet integral; Aggregation functions; Probit model; Semi-compensatory behavior; Attribute cut-offs
3	作者	Jiantao Guo, Juliang Zhang, T.C.E. Cheng, Shouting Zhao,
	题名	Truthful double auction mechanisms for online freight platforms with transaction costs,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000285
	关键词	Keywords: Logistics management; Transport procurement mechanism; Double auction; Mechanism design; Information asymmetry
4	作者	Xiaojie Luan, Francesco Corman,
	题名	Passenger-oriented traffic control for rail networks: An optimization model considering crowding effects on passenger choices and train operations,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000273
	关键词	Keywords: Traffic management; Passenger rerouting; Integrated optimization; Crowding effects; System optimum
5	作者	Rong Fan, Xuegang (Jeff) Ban,

	题名	Commuting service platform: Concept and analysis,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000121
	关键词	Keywords: Commuting service platform (CSP); Two-sided market; New mobility services; Travel demand management (TDM); Employer-centered TDM; Generalized Nash game
6	作者	Martin L. Hazelton,
	题名	The emergence of stochastic user equilibria in day-to-day traffic models,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000297
	关键词	Keywords: Day-to-day dynamics; GSUE; Markov process; Stochastic optimization; SUE; Traffic assignment
7	作者	Qin Zhang, Richard Martin Lusby, Pan Shang, Xiaoning Zhu,
	题名	A heuristic approach to integrate train timetabling, platforming, and railway network maintenance scheduling decisions,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000212
	关键词	Keywords: High-speed railway; Integration; Train platforming; Train timetabling; Maintenance planning; Dynamic time window
8	作者	Bin Yu, Wenxuan Shan, Jiuh-Bing Sheu, Ali Diabat,
	题名	Branch-and-price for a combined order selection and distribution problem in online community group-buying of perishable products,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000431
	关键词	Keywords: Vehicle routing problem with profits; Multi-period; Discrete split delivery; Perishability; Multi-commodity; Branch-and-price
9	作者	Özge Şafak, Özlem Çavuş, M. Selim Aktürk,
	题名	A two-stage decision dependent stochastic approach for airline flight network expansion,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000224
	关键词	Keywords: Airline flight network expansion; Stochastic programming; Decision dependent probabilities; Nonlinear mixed-integer

		programming
10	作者	Xuehao Feng, Yucheng He, Kap-Hwan Kim,
	题名	Space planning considering congestion in container terminal yards,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000315
	关键词	Keywords: Space planning; Container terminal; Congestion; Priority queue; Heuristic algorithm
11	作者	Yuan Gao, Jun Xia, Andrea D'Ariano, Lixing Yang,
	题名	Weekly rolling stock planning in Chinese high-speed rail networks,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000248
	关键词	Keywords: Rolling stock; (Un)coupling operations; Maintenance; Branch-and-price; High-speed rail
12	作者	Liudmila Tumash, Carlos Canudas-de-Wit, Maria Laura Delle Monache,
	题名	Multi-directional continuous traffic model for large-scale urban networks,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000303
	关键词	Keywords: Macroscopic model for urban traffic; Partial differential equations; Simulation and validation; Continuation of ODE to PDE; Conservation laws
13	作者	Carlos F. Daganzo,
	题名	An operating system for extra long urban trains,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000108
	关键词	Keywords: Transit operations; Scheduling algorithms; Routing and stopping strategies; Subway capacity; Urban railways; Long trains; Railway productivity; Passenger information systems
14	作者	Filipe Rodrigues,

	题名	Scaling Bayesian inference of mixed multinomial logit models to large datasets,
	网址	https://www.sciencedirect.com/science/article/pii/S019126152200011X
	关键词	Keywords: Mixed logit; Amortized variational inference; Stochastic variational inference; Discrete choice models; Bayesian inference
15	作者	Jiaqi Guo, Jiancheng Long, Xiaoming Xu, Miao Yu, Kai Yuan,
	题名	The vehicle routing problem of intercity ride-sharing between two cities,
	网址	https://www.sciencedirect.com/science/article/pii/S0191261522000327
	关键词	Keywords: Intercity ride-sharing; Vehicle routing problem; Variable neighborhood search; Neighborhood operator; Local search
16	作者	Rui Yao, Shlomo Bekhor,
	题名	A variational autoencoder approach for choice set generation and implicit perception of alternatives in choice modeling,
	网址	https://www.sciencedirect.com/science/article/pii/S019126152200042X
	关键词	Keywords: Variational autoencoder; Implicit availability/perception; Choice modeling; Route choice; Cross-nested logit

3、Transportation Research Part C:Emerging Technologies



图 15 Part C 期刊封面

(1) 期刊网址: <http://www.sciencedirect.com/science/journal/0968090X>

(2) 期刊介绍:《Transportation Research Part C:Emerging Technologies》发表涉及交通系统和新兴技术领域的发展、应用和影响。即期刊所收录的核心内容在运输方面,关注点不在于单个技术本身,而在于它们对交通系统、服务的规划、设计、运营、控制、维护和修复的最终影响;鼓励整合运筹学、控制系统、复杂网络、计算机科学、人工智能等领域的定量方法;特别关注新兴技术对交通系统性能的影响,包括监控、效率、安全性、可靠性、资源消耗和环境。以下方面运输领域的论文颇受欢迎:多式联运;按需运输;智能交通系统;交通和需求管理;联网和自动驾驶汽车;铁路;资源和基础设施管理;航空;行人和软模式。

(3) 出版信息:

ISSN: 0968-090X EISSN: 1879-2359

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

图 16 Part C 期刊出版信息

(3) JCR 收录情况: 收录在 TRANSPORTATION SCIENCE & TECHNOLOGY

- SCIE, 排名为:

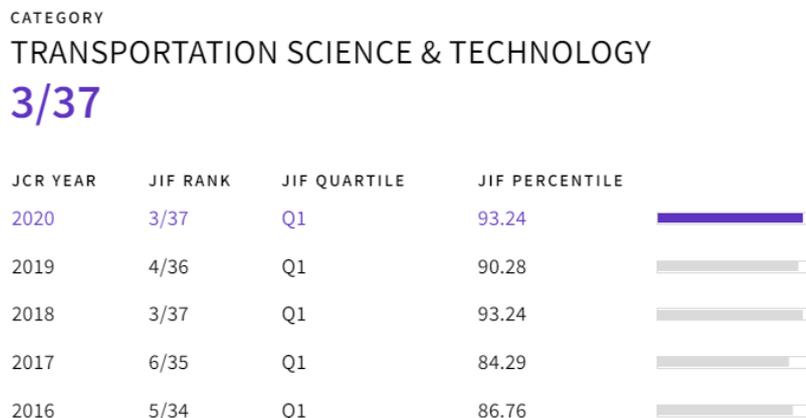


图 17 Part C 期刊分区情况

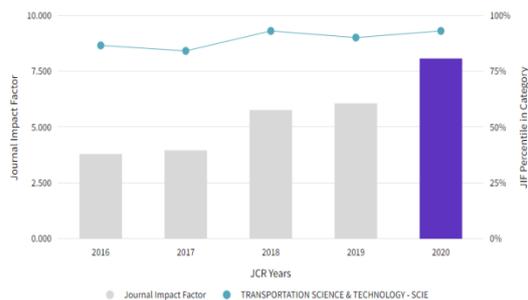


图 18 Part C 期刊隶属学科影响因子趋势图

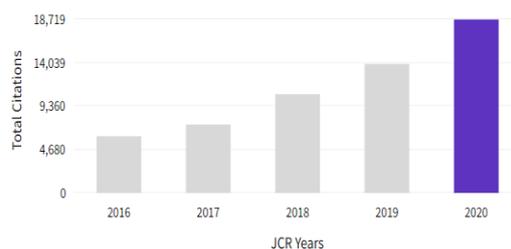


图 19 Part C 期刊总被引量趋势图

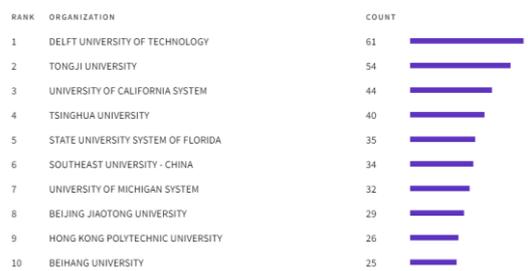


图 20 Part C 期刊发文机构 TOP10

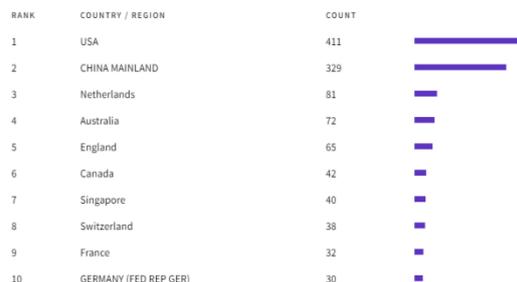


图 21 Part C 期刊发文国家 TOP10

表 6 Part C 期刊被引量 TOP20 文章

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
1	Wu, Yuankai;Tan, Huachun;Qin, Lingqiao;Ran, Bin;Jiang, Zhuxi	A hybrid deep learning based traffic flow prediction method and its understanding	2018	Article	84
2	Zhang, Tingru;Tao, Da;Qu, Xingda;Zhang, Xiaoyan;Lin, Rui;Zhang, Wei	The roles of initial trust and perceived risk in public's acceptance of automated vehicles	2019	Article	52
3	Gkartzonikas, Christos;Gkritza, Konstantina	What have we learned? A review of stated preference and choice studies on autonomous vehicles	2019	Review	52
4	Liu, Yang;Liu, Zhiyuan;Jia, Ruo	DeepPF: A deep learning based architecture for metro passenger flow prediction	2019	Article	48
5	Stern, Raphael E.;Wu, Fangyu;Piccoli, Benedetto;Seibold, Benjamin;Sprinkle, Jonathan;Work, Daniel B.;Cui, Shumo;Delle Monache, Maria Laura;Bhadani, Rahul;Bunting, Matt; et al.	Dissipation of stop-and-go waves via control of autonomous vehicles: Field experiments	2018	Article	45
6	Xu, Zhigang;Zhang, Kaifan;Min, Haigen;Wang, Zhen;Zhao, Xiangmo;Liu, Peng	What drives people to accept automated vehicles? Findings from a field experiment	2018	Article	45
7	Van Brummelen, Jessica;O'Brien, Marie;Gruyer, Dominique;Najjaran, Homayoun	Autonomous vehicle perception: The technology of today and tomorrow	2018	Review	44

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
8	Panagiotopoulos, Ilias;Dimitrakopoulos, George	An empirical investigation on consumers' intentions towards autonomous driving	2018	Article	43
9	Quang Minh Ha;Deville, Yves;Quang Dung Pham;Minh Hoang Ha	On the min-cost Traveling Salesman Problem with Drone	2018	Article	42
10	Wang, Chen;Xu, Chengcheng;Xia, Jingxin;Qian, Zhendong;Lu, Linjun	A combined use of microscopic traffic simulation and extreme value methods for traffic safety evaluation	2018	Article	39
11	Dabiri, Sina;Heaslip, Kevin	Inferring transportation modes from GPS trajectories using a convolutional neural network	2018	Article	37
12	Zhang, Zhenhua;He, Qing;Gao, Jing;Ni, Ming	A deep learning approach for detecting traffic accidents from social media data	2018	Article	37
13	Hyland, Michael;Mahmassani, Hani S.	Dynamic autonomous vehicle fleet operations: Optimization-based strategies to assign AVs to immediate traveler demand requests	2018	Article	36
14	He, Jia;Yang, Hai;Tang, Tie-Qiao;Huang, Hai-Jun	An optimal charging station location model with the consideration of electric vehicle's driving range	2018	Article	33
15	Xu, Chengcheng;Ji, Junyi;Liu, Pan	The station-free sharing bike demand forecasting with a deep learning approach and large-scale datasets	2018	Article	32
16	Caggiani, Leonardo;Camporeale, Rosalia;Ottomanelli, Michele;Szeto, Wai Yuen	A modeling framework for the dynamic management of free-floating bike-sharing systems	2018	Article	31
17	Lin, Lei;He, Zhengbing;Peeta, Srinivas	Predicting station-level hourly demand in a large-scale bike sharing network: A graph convolutional neural network approach	2018	Article	31

序号	Authors	Item Title	Publication Year	Document Type	Number of Citations
18	Simoni, Michele D.;Kockelman, Kara M.;Gurumurthy, Krishna M.;Bischoff, Joschka	Congestion pricing in a world of self-driving vehicles: An analysis of different strategies in alternative future scenarios	2019	Article	30
19	Loeb, Benjamin;Kockelman, Kara M.;Liu, Jun	Shared autonomous electric vehicle (SAEV) operations across the Austin, Texas network with charging infrastructure decisions	2018	Article	30
20	Talebian, Ahmadreza;Mishra, Sabyasachee	Predicting the adoption of connected autonomous vehicles: A new approach based on the theory of diffusion of innovations	2018	Article	30

表 7 Part C 期刊最新收录文章

序号	详细信息	
1	作者	Zhongcan Li, Ping Huang, Chao Wen, Xi Jiang, Filipe Rodrigues,
	题名	Prediction of train arrival delays considering route conflicts at multi-line stations,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000523
	关键词	Keywords: Train delay prediction; Route conflicts; Word embedding; Deep learning; Multi-line stations
2	作者	Xinyuan Zhang, Cong Zhao, Feixiong Liao, Xinghua Li, Yuchuan Du,
	题名	Online parking assignment in an environment of partially connected vehicles: A multi-agent deep reinforcement learning approach,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000699
	关键词	Keywords: Online parking assignment; Partially connected vehicles; Multi-agent; Deep reinforcement learning
3	作者	Hai-Jun Huang, Ziyou Gao, Hai Yang,
	题名	Preface,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000687
	关键词	
4	作者	Guopeng Li, Victor L. Knoop, Hans van Lint,
	题名	Estimate the limit of predictability in short-term traffic forecasting: An entropy-based approach,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000535
	关键词	Keywords: Traffic forecasting; Information theory; Conditional differential entropy; Predictability analysis
5	作者	Shuang Yang, Jianjun Wu, Huijun Sun, Yunchao Qu, David Z.W. Wang,
	题名	Integrated optimization of pricing and relocation in the competitive carsharing market: A multi-leader-follower game model,

	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000596
	关键词	Keywords: Competitive carsharing market; Pricing; Relocation; Multi-leader–follower game; Stochastic user equilibrium
6	作者	Meng Xu, Yining Di, Zheng Zhu, Hai Yang, Xiqun Chen,
	题名	Designing van-based mobile battery swapping and rebalancing services for dockless ebike-sharing systems based on the dueling double deep Q-network,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000651
	关键词	Keywords: Dockless ebike-sharing systems; Reinforcement learning; Ebike rebalancing; Battery swapping
7	作者	Leya Zeng, Buhong Wang, Tianrui Wang, Zhen Wang,
	题名	Research on delay propagation mechanism of air traffic control system based on causal inference,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000675
	关键词	Keywords: Delay propagation; Causal inference; Extreme events; Complex network
8	作者	Ziyuan Gu, Zelin Wang, Zhiyuan Liu, Meead Saberi,
	题名	Network traffic instability with automated driving and cooperative merging,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000717
	关键词	Keywords: Macroscopic fundamental diagram; Network fundamental diagram; Network traffic stability; Connected and automated vehicles; Cooperative merging; Adaptive driving
9	作者	Mihalis G. Markakis, Kalyan Talluri, Dmitrii Tikhonenko,
	题名	Managing lane-changing of algorithm-assisted drivers,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000328
	关键词	Keywords: Vehicular transportation; Traffic oscillations; Dynamic programming; Optimal merging; Traffic micro-simulations

10	作者	Miquel Estrada, Josep Mensión, Miquel Salicrú, Hugo Badia,
	题名	Charging operations in battery electric bus systems considering fleet size variability along the service,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000559
	关键词	Keywords: BEB; Opportunity charging; Overnight charging; Battery pack; Bus reliability
11	作者	Mostafa Salari, Lina Kattan, Monica Gentili,
	题名	Optimal roadside units location for path flow reconstruction in a connected vehicle environment,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000705
	关键词	Keywords: Roadside Unit; Traffic surveillance; Connected vehicle; Path flow reconstruction; Connectivity; Coverage range; Network sensor location problem
12	作者	Ramon Auad-Perez, Pascal Van Hentenryck,
	题名	Ridesharing and fleet sizing for On-Demand Multimodal Transit Systems,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000407
	关键词	Keywords: Ridesharing; Fleet sizing; Multimodal Transit System; Optimization; On-demand Transportation
13	作者	Pengcheng Wang, Xiaozheng He, Yu Wei, Xinkai Wu, Yunpeng Wang,
	题名	Damping behavior analysis for connected automated vehicles with linear car following control,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000638
	关键词	Keywords: Connected automated vehicles; Damping; Traffic oscillation; Platoon instability; Mechanical vibration theory
14	作者	Siyuan Feng, Peibo Duan, Jintao Ke, Hai Yang,
	题名	Coordinating ride-sourcing and public transport services with a reinforcement learning approach,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000572
	关键词	Keywords: Ride-sourcing service; Multimodal transportation; Reinforcement learning; Order dispatching; Public transit

15	作者	Anye Zhou, Srinivas Peeta, Menglin Yang, Jian Wang,
	题名	Cooperative signal-free intersection control using virtual platooning and traffic flow regulation,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000560
	关键词	Keywords: Cooperative signal-free intersection control; Connected and autonomous vehicle; Virtual platooning control; Adaptive sliding mode control; Constrained optimal control
16	作者	Daniele Gammelli, Yihua Wang, Dennis Prak, Filipe Rodrigues, Stefan Minner, Francisco Camara Pereira,
	题名	Predictive and prescriptive performance of bike-sharing demand forecasts for inventory management,
	网址	https://www.sciencedirect.com/science/article/pii/S0968090X22000183
	关键词	Keywords: Bike-sharing system; Rebalancing problem; Demand forecast; Inventory level; Deep generative model

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、期刊被引量 TOP20 文章等数据来源于 <https://jcr.clarivate.com/>
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