Tornabene's Collocation in the **Career 2017 (1996-2017)** and **Career 2018 (1996-2018)** rankings considering the **C-Indicator**.

Ranking per Area	WORLD Rank C (with self-citations)	WORLD Rank C (without self-citations)	ITALIAN Rank C (with self-citations)	ITALIAN Rank C (without self-citations)
All Areas (Career 2018 (1995-2018))	18006 (/105000)	36312 (/105000)	289 (/2282)	585 (/2282)
All Areas (Career 2017 (1995-2017))	26846 (/105026)	65632 (/105026)	399 (/2063)	1087 (/2063)
Engineering (Career 2018 (1995-2018))	572 (/4230)	1219 (/4230)	11 (/118)	21 (/118)
Engineering (Career 2017 (1995-2017))	685 (/3444)	1961 (/3444)	14 (/93)	39 (/93)
Mechanical Engineering (Career 2018 (1995-2018))	195 (/1323)	383 (/1323)	3 (/31)	4 (/31)
Mechanical Engineering (Career 2017 (1995-2017))	239 (/1190)	673 (/1190)	4 (/24)	8 (/24)
Materials (Career 2018 (1995-2018))	405 (/2540)	799 (/2540)	4 (/39)	8 (/39)
Materials (Career 2017 (1995-2017))	570 (/2398)	1002 (/2398)	7 (/31)	12 (/31)

Tornabene's Collocation in the **Single Year Career 2017** ranking considering the **C-Indicator**.

Single Year Career 2017 Ranking per Area	WORLD Rank C (with self-citations)	WORLD Rank C (without self-citations)	ITALIAN Rank C (with self-citations)	ITALIAN Rank C (without self-citations)
All Areas	1734 (/106368)	4769 (/106368)	20 (/2353)	66 (/2353)
Engineering	74 (/5804)	206 (/5804)	2 (/204)	2 (/204)
Mechanical Engineering	28 (/1709)	71 (/1709)	2 (/65)	2 (/65)
Materials	54 (/3561)	152 (/3561)	2 (/60)	3 (/60)

* Source Paper: Ioannidis JPA, Baas J, Klavans R, Boyack KW (2019), *A Standardized Citation Metrics Author Database Annotated for Scientific Field*, **PLoS Biol 17(8)**: e3000384. https://doi.org/10.1371/journal.pbio.3000384

Tornabene's Collocation in the **Career 2017 (1996-2017)** and **Career 2018 (1996-2018)** rankings considering the **h-index**.

Ranking per Area	WORLD h-index (with self-citations)	WORLD h-index (without self-citations)	ITALIAN h-index (with self-citations)	ITALIAN h-index (without self-citations)
All Areas (Career 2018 (1995-2018))	33229 (/105000)	65149 (/105000)	853 (/2282)	1526 (/2282)
All Areas (Career 2017 (1995-2017))	45121 (/105026)	85521 (/105026)	1016 (/2063)	1778 (/2063)
Engineering (Career 2018 (1995-2018))	624 (/4230)	1730 (/4230)	13 (/118)	40 (/118)
Engineering (Career 2017 (1995-2017))	752 (/3444)	2249 (/3444)	16 (/93)	55 (/93)
Mechanical Engineering (Career 2018 (1995-2018))	172 (/1323)	489 (/1323)	3 (/31)	8 (/31)
Mechanical Engineering (Career 2017 (1995-2017))	236 (/1190)	734 (/1190)	3 (/24)	10 (/24)
Materials (Career 2018 (1995-2018))	706 (/2540)	1475 (/2540)	7 (/39)	8 (/39)
Materials (Career 2017 (1995-2017))	923 (/2398)	1910 (/2398)	7 (/31)	20 (/31)

Tornabene's Collocation in the **Single Year Career 2017** ranking considering the **h-index**.

Single Year Career 2017 Ranking per Area	WORLD h-index (with self-citations)	WORLD h-index (without self-citations)	ITALIAN h-index (with self-citations)	ITALIAN h-index (without self-citations)
All Areas	9854 (/106368)	25093 (/106368)	175 (/2353)	466 (/2353)
Engineering	224 (/5804)	727 (/5804)	3 (/204)	8 (/204)
Mechanical Engineering	60 (/1709)	173 (/1709)	2 (/65)	3 (/65)
Materials	303 (/3561)	860 (/3561)	3 (/60)	4 (/60)

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Top Italian Scientists in the **Mechanical Engineering Area** from **Career 1996-2018 (23 years)**.

N	Name	University	Rank C	Academic years
1	Carrera, Erasmo	Polytechnic University of Turin	6623	41
2	Carpinteri, Alberto	Polytechnic University of Turin	14748	42
3	Auricchio, Ferdinando	University of Pavia	34364	28
4	Tornabene, Francesco	University of Salento	36312	16
5	Schrefler, Bernhard A.	University of Padova	41223	49
6	Pugno, Nicola M.	University of Trento	42098	22
7	Maier, Giulio	Polytechnic University of Milan	49597	55
8	Orlandi, P.	University of Rome La Sapienza	59408	45
9	Steigmann, David J.	University of L'Aquila	60782	37
10	Ciavarella, Michele	Polytechnic University of Bari	63403	23
11	Polizzotto, Castrenze	University of Palermo	69199	46
12	Carpinteri, Andrea	University of Parma	71071	36
13	Di Sciuva, Marco	Polytechnic University of Turin	72339	34
14	Di felice, Renzo	University of Genoa	72375	36
15	Luongo, Angelo	University of L'Aquila	72386	40
16	Morini, Gian Luca	University of Bologna	75065	26
17	Barletta, Antonio	University of Bologna	84555	34
18	dell'Isola, Francesco	University of Rome La Sapienza	91347	33
19	Di Paola, M.	University of Palermo	93319	40
20	Milani, Gabriele	Polytechnic University of Milan	95080	16
21	Pook, L. P.	University of Cassino and Southern Lazio	96498	51
22	Cavallini, Alberto	University of Padova	97900	45
23	Rega, Giuseppe	University of Rome La Sapienza	99146	47
24	Nova, R.	Polytechnic University of Milan	100581	44
25	DeSimone, Antonio	International School for Advanced Studies	100701	27
26	D'Anna, Andrea	University of Naples Federico II	102919	34
27	Lazzarin, P.	University of Padova	113479	30
28	Bigoni, D.	University of Trento	114973	32
29	Brischetto, S.	Polytechnic University of Turin	131740	13
30	Viola, Erasmo	University of Bologna	138687	43
31	Fraternali, Fernando	University of Salerno	151378	28

* Source Paper: Ioannidis JPA, Baas J, Klavans R, Boyack KW (2019), *A Standardized Citation Metrics Author Database Annotated for Scientific Field*, **PLoS Biol 17(8)**: e3000384. https://doi.org/10.1371/journal.pbio.3000384

Top Italian Scientists in the **Materials Area** from **Career 1996-2018 (23 years)**.

N	Name	University	Rank C	Academic years
1	Antolini, Ermete	Scuola di Scienza dei Materiali	3153	31
2	Carrera, Erasmo	Polytechnic University of Turin	6623	41
3	Trovarelli, Alessandro	University of Udine	8172	32
4	Kenny, Jose	University of Perugia	19791	36
5	Colombo, Paolo	University of Padova	20896	32
6	Zotti, Gianni	ICMCTE Stati Uniti	30809	45
7	Innocenzi, Plinio	CR-INSTM	33515	28
8	Tornabene, Francesco	University of Salento	36312	16
9	Monteverde, FredÃªric	CNR	36797	26
10	Taylor, H. F.W.	University of Pisa	40996	55
11	Pugno, Nicola M.	University of Trento	42098	22
12	La Mantia, F. P.	University of Palermo	50853	44
13	Gualtieri, Alessandro F.	University of Modena and Reggio Emilia	52303	29
14	Martuscelli, E.	CNR	55783	40
15	Palenzona, A.	University of Genoa	57725	52
16	Ravindran, Ponniah	University of Padova	58147	40
17	Lutterotti, L.	University of Trento	63586	30
18	Cavaliere, Pasquale	University of Salento	67757	20
19	Carpinteri, Andrea	University of Parma	71071	36
20	Di Sciuva, Marco	Polytechnic University of Turin	72339	34
21	Guglielmi, Massimo	University of Padova	72392	39
22	Valentini, L.	University of Perugia	78559	19
23	Sorarù, Giandomenico	University of Trento	83744	39
24	Delogu, Francesco	University of Cagliari	85345	23
25	Umbrello, Domenico	University of Calabria	86678	16
26	Carpi, Federico	University of Florence	86679	17
27	Scardi, Paolo	University of Trento	89231	35
28	Pegoretti, Alessandro	University of Trento	93652	31
29	Foraboschi, Paolo	Università IUAV di Venezia	94538	27
30	Sangermano, Marco	Polytechnic University of Turin	97831	21
31	Croce, Fausto	Gabriele dâ€™Annunzio University	98738	42
32	Corinaldesi, Valeria	Marche Polytechnic University	99041	18
33	Teti, Roberto	University of Naples Federico II	104800	39
34	Lazzarin, P.	University of Padova	113479	30
35	Brischetto, S.	Polytechnic University of Turin	131740	13
36	Viola, Erasmo	University of Bologna	138687	43
37	Guerra, Gaetano	University of Salerno	151230	43
38	Fraternali, Fernando	University of Salerno	151378	28
39	Bozzini, Benedetto	University of Salento	165897	30

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Top Italian Scientists in the **Engineering Area** from **Career 1996-2018 (23 years)**.

N	Name	University	Rank C	Academic years
1	Bemporad, Alberto	IMT Institute for Advanced Studies Lucca	6559	26
2	Carrera, Erasmo	Polytechnic University of Turin	6623	41
3	Reverchon, Ernesto	University of Salerno	7797	38
4	Bicchi, Antonio	University of Pisa	11087	35
5	Mattavelli, Paolo	University of Padova	11252	27
6	Ambrosio, Luigi	CNR	11857	36
7	Isidori, Alberto	University of Rome La Sapienza	14717	52
8	Carpinteri, Alberto	Polytechnic University of Turin	14748	42
9	Drioli, Enrico	University of Calabria	17206	47
10	Bruzzone, Lorenzo	University of Trento	18274	26
11	Marino, Riccardo	University of Rome Tor Vergata	21112	38
12	Dario, Paolo	Sant'Anna School of Advanced Studies	21982	41
13	Blanchini, Franco	University of Udine	22332	30
14	Bianchi, Nicola	University of Padova	23191	25
15	Siciliano, Bruno	University of Naples Federico II	28573	35
16	Tomei, Patrizio	University of Rome Tor Vergata	30554	35
17	De Luca, Alessandro	University of Rome La Sapienza	32491	35
18	Auricchio, Ferdinando	University of Pavia	34364	28
19	Soave, Giorgio	Eniricerche SpA	34629	46
20	Cappozzo, Aurelio	University of Rome â€œForo Italicoâ€	35158	45
21	Tornabene, Francesco	University of Salento	36312	16
22	Di Bernardo, Mario	University of Naples Federico II	36314	24
23	Caprara, Alberto	University of Bologna	36632	22
24	Crosta, Giovanni B.	University of Milan - Bicocca	36647	29
25	Todini, Ezio	Italian Hydrological Society	36813	46
26	Toth, Paolo	University of Bologna	39956	44
27	Schrefler, Bernhard A.	University of Padova	41223	49
28	Sabatini, Angelo M.	Sant'Anna School of Advanced Studies	41536	33
29	Pugno, Nicola M.	University of Trento	42098	22
30	Melgani, Farid	University of Trento	42302	20
31	Montanari, Alberto	University of Bologna	42357	24
32	Schenato, Luca	University of Padova	43023	19
33	De Rossi, Danilo	University of Pisa	43298	41
34	Scattolini, Riccardo	Polytechnic University of Milan	47156	39
35	Maier, Giulio	Polytechnic University of Milan	49597	55
36	Caldwell, Darwin G.	Italian Institute of Technology	52203	31
37	Visioli, Antonio	University of Brescia	53977	24
38	Remondino, Fabio	Fondazione Bruno Kessler	54017	18
39	Saracco, Guido	Polytechnic University of Turin	56804	27
40	Orlandi, P.	University of Rome La Sapienza	59408	45
41	Fornaro, Gianfranco	CNR	59427	25
42	Gamba, Paolo	University of Pavia	60601	27
43	Steigmann, David J.	University of L'Aquila	60782	37
44	Vegliò, Francesco	University of L'Aquila	61056	28

45	Ciavarella, Michele	Polytechnic University of Bari	63403	23
46	Calafiore, Giuseppe Carlo	Polytechnic University of Turin	63618	23
47	Chiaverini, Stefano	University of Cassino and Southern Lazio	64301	30
48	Antonelli, Gianluca	University of Cassino and Southern Lazio	65472	23
49	Boglietti, Aldo	Polytechnic University of Turin	66501	32
50	Rinaldo, Andrea	University of Padova	66704	40
51	Franceschetti, Giorgio	CNR	69196	56
52	Polizzotto, Castrenze	University of Palermo	69199	46
53	Borga, Marco	University of Padova	70449	29
54	Carpinteri, Andrea	University of Parma	71071	36
55	Fischetti, Matteo	University of Padova	71481	33
56	Malesani, L.	University of Padova	71616	18
57	Di Sciuva, Marco	Polytechnic University of Turin	72339	34
58	Di felice, Renzo	University of Genoa	72375	36
59	Luongo, Angelo	University of L'Aquila	72386	40
60	Morini, Gian Luca	University of Bologna	75065	26
61	Fino, Debora	Polytechnic University of Turin	75521	18
62	Amato, F.	University of Naples Federico II	75879	28
63	Giua, Alessandro	University of Cagliari	76435	31
64	Laio, Francesco	Polytechnic University of Turin	76600	19
65	Borgonovo, Emanuele	Bocconi University	77168	20
66	Russo, Fabrizio	University of Trieste	77190	33
67	De Roo, A.	European Commission Joint Research Centre	77289	31
68	Arena, Umberto	University of Campania Luigi Vanvitelli	78495	37
69	Netti, Paolo A.	University of Naples Federico II	78750	28
70	Maloberti, Franco	University of Pavia	82104	47
71	Braglia, Marcello	University of Pisa	82908	30
72	Lanari, Riccardo	CNR	83346	29
73	Bartolini, Giorgio	CNR	83588	40
74	Facchinei, Francisco	University of Rome La Sapienza	83852	27
75	Barletta, Antonio	University of Bologna	84555	34
76	Uhlenbrook, Stefan	UN World Water Assessment Programme	84699	22
77	Buja, Giuseppe	University of Padova	84903	45
78	Martello, Silvano	University of Bologna	85888	43
79	Umbrello, Domenico	University of Calabria	86678	16
80	Carpi, Federico	University of Florence	86679	17
81	Spiazzi, Giorgio	University of Padova	86838	30
82	Solari, Giovanni	University of Genoa	89083	41
83	Ferro, Vito	University of Palermo	90456	30
84	dell'Isola, Francesco	University of Rome La Sapienza	91347	33
85	Rizzo, Luigi	University of Salerno	91628	16
86	Colaneri, Patrizio	CNR	92344	37
87	Di Paola, M.	University of Palermo	93319	40
88	Valcher, Maria Elena	University of Padova	94144	27
89	Forti, Mauro	University of Siena	94363	32
90	Foraboschi, Paolo	Università IUAV di Venezia	94538	27
91	Milani, Gabriele	Polytechnic University of Milan	95080	16

92	Di Gregorio, Raffaele	University of Ferrara	95144	25
93	Ferrero, Alessandro	Polytechnic University of Milan	96101	40
94	Pook, L. P.	University of Cassino and Southern Lazio	96498	51
95	Cavallini, Alberto	University of Padova	97900	45
96	Oriolo, Giuseppe	University of Rome La Sapienza	99015	31
97	Rega, Giuseppe	University of Rome La Sapienza	99146	47
98	Chiuso, Alessandro	University of Padova	99290	22
99	Astarita, Gianni	University of Naples Federico II	99334	57
100	Nova, R.	Polytechnic University of Milan	100581	44
101	DeSimone, Antonio	International School for Advanced Studies	100701	27
102	Morbidelli, Massimo	Polytechnic University of Milan	100713	41
103	D'Anna, Andrea	University of Naples Federico II	102919	34
104	Maselli, Fabio	CNR	103518	33
105	Cristofolini, Luca	University of Bologna	103753	26
106	Teti, Roberto	University of Naples Federico II	104800	39
107	De Nicolao, Giuseppe	University of Pavia	105192	34
108	Palumbo, Gaetano	University of Catania	107145	30
109	Lenzi, Mario Aristide	University of Padova	108372	31
110	Marchisio, Daniele L.	Polytechnic University of Turin	111303	21
111	Savaresi, Sergio M.	Polytechnic University of Milan	111953	24
112	Lazzarin, P.	University of Padova	113479	30
113	Bigoni, D.	University of Trento	114973	32
114	Brischetto, S.	Polytechnic University of Turin	131740	13
115	Viola, Erasmo	University of Bologna	138687	43
116	Fraternali, Fernando	University of Salerno	151378	28
117	Sergeyev, Yaroslav D.	University of Calabria	169742	28
118	Pepe, Pierdomenico	University of L'Aquila	174775	26

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Top Italian Scientists in the **Mechanical Engineering Area** from **Career 1996-2017 (22 years)**.

N	Name	University	Rank C	Academic years
1	Carrera, E.	Politecnico di Torino	6210	29
2	Carpinteri, Alberto	Politecnico di Torino	16727	41
3	Auricchio, Ferdinando	University of Pavia	34307	27
4	Schrefler, B.A.	University of Padova	41849	42
5	Maier, G.	Politecnico di Milano	46911	52
6	Pugno, Nicola M.	University of Trento	52826	21
7	Orlandi, P.	University of Rome La Sapienza	61755	52
8	Tornabene, Francesco	University of Bologna	65632	15
9	Ciavarella, M.	Politecnico di Bari	66165	22
10	Cavaliere, P.	University of Lecce	69050	19
11	Di Felice, Renzo	University of Genoa	71471	34
12	Luongo, Angelo	University of L'Aquila	73609	39
13	Morini, Gian Luca	University of Bologna	74148	25
14	Polizzotto, Castrenze	Universita di Palermo	75696	45
15	Carpinteri, Andrea	University of Parma	76773	35
16	Di Sciuva, Marco	Politecnico di Torino	77385	34
17	Barletta, A.	University of Bologna	89137	33
18	Solari, Giovanni	University of Genoa	90291	53
19	Rega, Giuseppe	University of Rome La Sapienza	100525	46
20	Pook, L.P.	University of Cassino	100769	51
21	Lazzarin, P.	University of Padova	116751	30
22	D'Anna, Andrea	University of Naples Federico II	130073	23
23	Milani, Gabriele	Politecnico di Milano	144345	15
24	Viola, Erasmo	University of Bologna	155425	43

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Top Italian Scientists in the **Materials Area** from **Career 1996-2017 (22 years)**.

N	Name	University	Rank C	Academic years
1	Carrera, E.	Politecnico di Torino	6210	29
2	Trovarelli, Alessandro	University of Udine	8274	31
3	Zotti, Gianni	CNR	22115	44
4	Colombo, Paolo	University of Padova	23993	31
5	Innocenzi, Plinio	University of Sassari	32327	27
6	Kenny, J.M.	University of Perugia	37428	35
7	Martuscelli, E.	CNR	51349	40
8	Palenzona, A.	University of Genoa	52603	52
9	Pugno, Nicola M.	University of Trento	52826	21
10	La Mantia, F.P.	University of Palermo	55172	43
11	Gualtieri, Alessandro F.	University of Modena and Reggio Emilia	59895	28
12	Tornabene, Francesco	University of Bologna	65632	15
13	Cavaliere, P.	University of Lecce	69050	19
14	Carpinteri, Andrea	University of Parma	76773	35
15	Di Sciuva, Marco	Politecnico di Torino	77385	34
16	Valentini, L.	University of Perugia	80858	18
17	Lutterotti, L.	University of Trento	82828	27
18	Trasatti, S.	University of Milan	89204	30
19	Carpi, Federico	University of Florence	90156	16
20	Delogu, Francesco	University of Cagliari	90636	22
21	Scandola, Mariastella	University of Bologna	93252	44
22	Scardi, P.	University of Trento	99431	34
23	Sangermano, Marco	Politecnico di Torino	100805	20
24	Umbrello, D.	University of Calabria	101522	15
25	Pegoretti, Alessandro	University of Trento	104956	30
26	Musto, Pellegrino	CNR	111390	35
27	Lazzarin, P.	University of Padova	116751	30
28	Guerra, Gaetano	University of Salerno	131632	42
29	Viola, Erasmo	University of Bologna	155425	43
30	Bozzini, Benedetto	University of Lecce	156826	29
31	Gesmundo, F.	University of Genoa	168690	39

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Top Italian Scientists in the **Engineering Area** from **Career 1996-2017 (22 years)**.

N	Name	University	Rank C	Academic years
1	Carrera, E.	Politecnico di Torino	6210	29
2	Reverchon, Ernesto	Universita di Salerno	7816	37
3	Mattavelli, Paolo	University of Padova	11487	26
4	Ambrosio, Luigi	CNR	11603	35
5	Isidori, Alberto	University of Rome La Sapienza	12830	47
6	Carpinteri, Alberto	Politecnico di Torino	16727	41
7	Astolfi, Alessandro	University of Rome Tor Vergata	17402	26
8	Drioli, Enrico	University of Calabria	18392	53
9	Marino, Riccardo	University of Rome Tor Vergata	19204	35
10	Bruzzone, Lorenzo	University of Trento	19897	25
11	Dario, Paolo	Scuola Superiore Sant'Anna	21321	40
12	Blanchini, Franco	University of Udine	26572	30
13	Bianchi, Nicola	University of Padova	29529	24
14	Tomei, Patrizio	University of Rome Tor Vergata	29833	35
15	Todini, E.	University of Bologna	33814	44
16	De Luca, Alessandro	University of Rome La Sapienza	33938	33
17	Auricchio, Ferdinando	University of Pavia	34307	27
18	Caprara, Alberto	University of Bologna	35390	22
19	Crosta, Giovanni B.	University of Milan - Bicocca	39348	28
20	Toth, Paolo	University of Bologna	40689	43
21	Schrefler, B.A.	University of Padova	41849	42
22	De Rossi, Danilo	University of Pisa	43340	41
23	Sabatini, Angelo M.	Scuola Superiore Sant'Anna	44087	31
24	Schenato, Luca	University of Padova	44927	18
25	Siciliano, Bruno	University of Naples Federico II	45629	34
26	Melgani, Farid	University of Trento	46430	19
27	Maier, G.	Politecnico di Milano	46911	52
28	Montanari, Alberto	University of Bologna	47667	22
29	Scattolini, Riccardo	Politecnico di Milano	49421	38
30	Pugno, Nicola M.	University of Trento	52826	21
31	Saracco, Guido	Politecnico di Torino	55731	26
32	Visioli, Antonio	University of Brescia	57471	23
33	Vegliò, Francesco	University of L'Aquila	58300	26
34	Chiaverini, Stefano	University of Cassino	61106	30
35	Orlandi, P.	University of Rome La Sapienza	61755	52
36	Fornaro, G.	CNR	62639	25
37	Rinaldo, Andrea	University of Padova	63033	37
38	Gamba, Paolo	University of Pavia	65010	26
39	Tornabene, Francesco	University of Bologna	65632	15
40	Ciavarella, M.	Politecnico di Bari	66165	22
41	Russo, Fabrizio	University of Trieste	67528	31
42	Calafiore, Giuseppe	Politecnico di Torino	67814	21
43	Cavaliere, P.	University of Lecce	69050	19
44	Lanari, R.	CNR	70674	28

45	Di Felice, Renzo	University of Genoa	71471	34
46	Ferrero, Alessandro	Politecnico di Milano	71839	40
47	Luongo, Angelo	University of L'Aquila	73609	39
48	Antonelli, Gianluca	University of Cassino	73673	22
49	Morini, Gian Luca	University of Bologna	74148	25
50	Boglietti, Aldo	Politecnico di Torino	74580	31
51	Polizzotto, Castrenze	Universita di Palermo	75696	45
52	Amato, F.	University Magna Graecia	76317	27
53	Carpinteri, Andrea	University of Parma	76773	35
54	de Roo, Ad	Joint Research Centre of Ispra	77310	30
55	Di Sciuva, Marco	Politecnico di Torino	77385	34
56	Maloberti, Franco	University of Pavia	77677	46
57	Borga, Marco	University of Padova	79186	28
58	Bartolini, Giorgio	CNR	79525	39
59	Facchinei, Francisco	University of Rome La Sapienza	83044	26
60	Laio, Francesco	Politecnico di Torino	83696	18
61	Braglia, Marcello	University of Pisa	84957	29
62	Spiazzi, Giorgio	University of Padova	85525	29
63	Colaneri, Patrizio	Politecnico di Milano	86073	35
64	Fino, Debora	Politecnico di Torino	86208	17
65	Netti, Paolo A.	University of Naples Federico II	87311	26
66	Borgonovo, Emanuele	Bocconi University	87910	19
67	Giua, Alessandro	University of Cagliari	88823	30
68	Barletta, A.	University of Bologna	89137	33
69	Carpi, Federico	University of Florence	90156	16
70	Solari, Giovanni	University of Genoa	90291	53
71	Ferro, Vito	Universita di Palermo	90864	54
72	Franceschetti, Giorgio	University of Naples Federico II	93727	46
73	Forti, Mauro	University of Siena	94324	31
74	Bolognani, Silverio	University of Padova	94398	39
75	Di Gregorio, Raffaele	University of Ferrara	94666	24
76	De Nicolao, Giuseppe	University of Pavia	96267	33
77	Palumbo, Gaetano	University of Catania	98819	29
78	Rega, Giuseppe	University of Rome La Sapienza	100525	46
79	Cristofolini, Luca	University of Bologna	100559	25
80	Zaccarian, Luca	University of Trento	100630	23
81	Pook, L.P.	University of Cassino	100769	51
82	Pook, L.P.	University of Cassino	100769	51
83	Umbrello, D.	University of Calabria	101522	15
84	Chiuso, Alessandro	University of Padova	104626	20
85	Ceccarelli, Marco	University of Cassino	105996	27
86	Lenzi, M.A.	University of Padova	107895	31
87	Savaresi, Sergio M.	Politecnico di Milano	107939	23
88	Lazzarin, P.	University of Padova	116751	30
89	D'Anna, Andrea	University of Naples Federico II	130073	23
90	Milani, Gabriele	Politecnico di Milano	144345	15
91	Viola, Erasmo	University of Bologna	155425	43

92	Andò, Bruno	University of Catania	192721	22
93	Sergeyev, Yaroslav D.	University of Calabria	217129	23

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Top Italian Scientists in the **Mechanical Engineering Area** from **Single Year Career 2017 (single year)**.

N	Name	University	Rank C
1	Carrera, E.	Politecnico di Torino	1464
2	Tornabene, Francesco	University of Bologna	4769
3	Carpinteri, Alberto	Politecnico di Torino	13178
4	Auricchio, Ferdinando	University of Pavia	16557
5	Pugno, Nicola M.	University of Trento	21066
6	Barretta, Raffaele	University of Naples Federico II	26245
7	Dell'Isola, F.	University of L'Aquila	26806
8	Corcione, Massimo	University of Rome La Sapienza	28215
9	Luongo, Angelo	University of L'Aquila	30065
10	Fraternali, Fernando	Universita di Salerno	31956
11	Viola, Erasmo	University of Bologna	40321
12	Milani, Gabriele	Politecnico di Milano	40620
13	Longo, Giovanni A.	University of Padova	40975
14	Schrefler, B.A.	University of Padova	41745
15	Lazzarin, P.	University of Padova	42582
16	Brischetto, S.	Politecnico di Torino	46300
17	Di Felice, Renzo	University of Genoa	49546
18	Franco, Alessandro	University of Pisa	49549
19	Polizzotto, Castrenze	Universita di Palermo	49583
20	Solari, Giovanni	University of Genoa	49873
21	Orlandi, P.	University of Rome La Sapienza	51348
22	Carpinteri, Andrea	University of Parma	51638
23	Andreaus, Ugo	University of Rome La Sapienza	52617
24	Cavaliere, P.	University of Lecce	52659
25	Ciavarella, M.	Politecnico di Bari	55651
26	Rega, Giuseppe	University of Rome La Sapienza	56667
27	Fantuzzi, Nicholas	University of Bologna	57076
28	Di Sciuva, Marco	Politecnico di Torino	60952
29	Carbone, G.	Politecnico di Bari	61320
30	Bigoni, D.	University of Trento	62691
31	Lacarbonara, Walter	University of Rome La Sapienza	63318
32	Guagliano, M.	Politecnico di Milano	64840
33	Maier, G.	Politecnico di Milano	68113
34	Asinari, Pietro	Politecnico di Torino	68761
35	Morini, Gian Luca	University of Bologna	70691
36	Marotti de Sciarra, Francesco	University of Naples Federico II	71110
37	Giorgio, Ivan	University of Rome La Sapienza	74706
38	Luchini, Paolo	Universita di Salerno	76707
39	Lorenzini, Giulio	University of Parma	78287
40	Tanda, Giovanni	University of Genoa	78953
41	Lazzarin, Renato M.	University of Padova	81086
42	Pook, L.P.	University of Cassino	81172
43	Barletta, A.	University of Bologna	82870
44	Di Paola, Mario	Universita di Palermo	84008

45	D'Anna, Andrea	University of Naples Federico II	84138
46	Del Col, Davide	University of Padova	85031
47	Brighenti, Roberto	University of Parma	87759
48	Pennacchi, Paolo	Politecnico di Milano	89962
49	Cavallini, Alberto	University of Padova	96973
50	Senneca, Osvalda	CNR	97614
51	Ambrosi, D.	Politecnico di Milano	100196
52	Quaresimin, M.	University of Padova	100978
53	Pellicano, Francesco	University of Modena and Reggio Emilia	108755
54	Lenci, Stefano	Universita Politecnica delle Marche	110958
55	Piccardo, Giuseppe	University of Genoa	114743
56	Cardone, Donatello	Universita della Basilicata	116589
57	Cazzani, Antonio	University of Cagliari	119420
58	Turco, Emilio	University of Sassari	133199
59	Feo, Luciano	Universita di Salerno	135358
60	Cinefra, M.	Politecnico di Torino	182330
61	Meneghetti, G.	University of Padova	183948
62	Pappalardo, Carmine M.	Universita di Salerno	204501
63	Carloni, Christian	University of Bologna	209594
64	Rionero, Salvatore	University of Naples Federico II	213665
65	Ruggeri, Tommaso	University of Bologna	223746

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Top Italian Scientists in the **Materials Area** from **Single Year Career 2017 (single year)**.

N	Name	University	Rank C
1	Carrera, E.	Politecnico di Torino	1464
2	Trovarelli, Alessandro	University of Udine	4652
3	Tornabene, Francesco	University of Bologna	4769
4	Colombo, Paolo	University of Padova	11657
5	Lambiase, F.	University of L'Aquila	20175
6	Pugno, Nicola M.	University of Trento	21066
7	Gualtieri, Alessandro F.	University of Modena and Reggio Emilia	24580
8	Lutterotti, L.	University of Trento	25807
9	Barretta, Raffaele	University of Naples Federico II	26245
10	Umbrello, D.	University of Calabria	28742
11	Innocenzi, Plinio	University of Sassari	29635
12	Corinaldesi, Valeria	Universita Politecnica delle Marche	31516
13	Fraternali, Fernando	Universita di Salerno	31956
14	Teti, R.	University of Naples Federico II	35360
15	Kenny, J.M.	University of Perugia	39744
16	Ombres, Luciano	University of Calabria	40287
17	Viola, Erasmo	University of Bologna	40321
18	Lazzarin, P.	University of Padova	42582
19	Brischetto, S.	Politecnico di Torino	46300
20	Carpi, Federico	University of Florence	46882
21	Carpinteri, Andrea	University of Parma	51638
22	Cavaliere, P.	University of Lecce	52659
23	Sangermano, Marco	Politecnico di Torino	53809
24	Perego, Carlo	Fondazione Eni Enrico Mattei	55428
25	Fantuzzi, Nicholas	University of Bologna	57076
26	Delogu, Francesco	University of Cagliari	58042
27	Di Sciuva, Marco	Politecnico di Torino	60952
28	Guagliano, M.	Politecnico di Milano	64840
29	Baino, Francesco	Politecnico di Torino	70556
30	Marotti de Sciarra, Francesco	University of Naples Federico II	71110
31	Trasatti, S.	University of Milan	74148
32	Casalino, G.	Politecnico di Bari	77762
33	Valentini, L.	University of Perugia	79911
34	Scardi, P.	University of Trento	82897
35	de Felice, Gianmarco	Universita Roma Tre	86983
36	Brighenti, Roberto	University of Parma	87759
37	Anselmi-Tamburini, Umberto	University of Pavia	88771
38	Dozio, Lorenzo	Politecnico di Milano	92229
39	Avella, Maurizio	CNR	95884
40	Bernardo, E.	University of Padova	97226
41	Zotti, Gianni	CNR	98414
42	Laurienzo, Paola	CNR	98510
43	Quaresimin, M.	University of Padova	100978
44	Mazzolani, F.M.	University of Naples Federico II	101442

45	Ardizzone, Silvia	University of Milan	102012
46	Santulli, C.	University of Camerino	103121
47	Meola, Carosena	University of Naples Federico II	103772
48	Franzoni, Elisa	University of Bologna	105060
49	Pantani, Roberto	Universita di Salerno	106162
50	Calignano, Flaviana	Politecnico di Torino	109359
51	Ceroni, Francesca	Universita degli Studi di Napoli Parthenope	115966
52	La Mantia, F.P.	Universita di Palermo	124146
53	Feo, Luciano	Universita di Salerno	135358
54	Fragassa, Cristiano	University of Bologna	154888
55	Sglavo, Vincenzo M.	University of Trento	159948
56	Cinefra, M.	Politecnico di Torino	182330
57	Meneghetti, G.	University of Padova	183948
58	Affatato, Saverio	Istituti Ortopedici Rizzoli, Bologna	205812
59	Carloni, Christian	University of Bologna	209594
60	Scaffaro, Roberto	Universita di Palermo	216134

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Top Italian Scientists in the **Engineering Area** from **Single Year Career 2017 (single year)**.

N	Name	University	Rank C
1	Carrera, E.	Politecnico di Torino	1464
2	Tornabene, Francesco	University of Bologna	4769
3	Mattavelli, Paolo	University of Padova	7036
4	Ambrosio, Luigi	CNR	7342
5	Drioli, Enrico	University of Calabria	7965
6	Bruzzone, Lorenzo	University of Trento	8074
7	Bianchi, Nicola	University of Padova	11056
8	Melgani, Farid	University of Trento	12223
9	Crosta, Giovanni B.	University of Milan - Bicocca	13125
10	Carpinteri, Alberto	Politecnico di Torino	13178
11	Sabatini, Angelo M.	Scuola Superiore Sant'Anna	13991
12	Reverchon, Ernesto	Universita di Salerno	15133
13	Auricchio, Ferdinando	University of Pavia	16557
14	Astolfi, Alessandro	University of Rome Tor Vergata	16919
15	Montanari, Alberto	University of Bologna	18666
16	Schenato, Luca	University of Padova	20169
17	Tarolli, Paolo	University of Padova	20919
18	Pugno, Nicola M.	University of Trento	21066
19	Gamba, Paolo	University of Pavia	21261
20	Borgonovo, Emanuele	Bocconi University	21731
21	Isidori, Alberto	University of Rome La Sapienza	22374
22	Boglietti, Aldo	Politecnico di Torino	22379
23	Todini, E.	University of Bologna	23522
24	Rizzo, Luigi	Universita di Salerno	24213
25	Scattolini, Riccardo	Politecnico di Milano	25337
26	De Luca, Alessandro	University of Rome La Sapienza	25877
27	Toth, Paolo	University of Bologna	26203
28	Barretta, Raffaele	University of Naples Federico II	26245
29	Dell'Isola, F.	University of L'Aquila	26806
30	Corcione, Massimo	University of Rome La Sapienza	28215
31	Umbrello, D.	University of Calabria	28742
32	Fornaro, G.	CNR	28884
33	Blanchini, Franco	University of Udine	29200
34	Siciliano, Bruno	University of Naples Federico II	29595
35	Luongo, Angelo	University of L'Aquila	30065
36	Valcher, Maria Elena	University of Padova	31610
37	Fraternali, Fernando	Universita di Salerno	31956
38	Fino, Debora	Politecnico di Torino	32828
39	Bolognani, Silverio	University of Padova	32990
40	Teti, R.	University of Naples Federico II	35360
41	De Rossi, Danilo	University of Pisa	35795
42	Calafiore, Giuseppe	Politecnico di Torino	38027
43	Chiaverini, Stefano	University of Cassino	38515
44	Visioli, Antonio	University of Brescia	38533

45	Antonelli, Gianluca	University of Cassino	38989
46	Borga, Marco	University of Padova	39083
47	Netti, Paolo A.	University of Naples Federico II	39979
48	Viola, Erasmo	University of Bologna	40321
49	Milani, Gabriele	Politecnico di Milano	40620
50	Longo, Giovanni A.	University of Padova	40975
51	Amato, F.	University Magna Graecia	41383
52	Schrefler, B.A.	University of Padova	41745
53	Lazzarin, P.	University of Padova	42582
54	Dario, Paolo	Scuola Superiore Sant'Anna	43756
55	Vagati, Alfredo	Politecnico di Torino	44699
56	Brischetto, S.	Politecnico di Torino	46300
57	Carpi, Federico	University of Florence	46882
58	Laio, Francesco	Politecnico di Torino	47019
59	Fornasini, Ettore	University of Padova	47112
60	Caprara, Alberto	University of Bologna	47587
61	Braglia, Marcello	University of Pisa	48103
62	Rinaldo, Andrea	University of Padova	49151
63	Fischetti, Matteo	University of Padova	49398
64	Di Felice, Renzo	University of Genoa	49546
65	Franco, Alessandro	University of Pisa	49549
66	Lanari, R.	CNR	49551
67	Polizzotto, Castrenze	Universita di Palermo	49583
68	Marino, Riccardo	University of Rome Tor Vergata	49791
69	Solari, Giovanni	University of Genoa	49873
70	Orlandi, P.	University of Rome La Sapienza	51348
71	Carpinteri, Andrea	University of Parma	51638
72	Andreaus, Ugo	University of Rome La Sapienza	52617
73	Cavaliere, P.	University of Lecce	52659
74	Gentile, Carmelo	Politecnico di Milano	54499
75	Micera, Silvestro	Scuola Superiore	55252
76	Ciavarella, M.	Politecnico di Bari	55651
77	Danese, Pamela	University of Padova	55928
78	Rega, Giuseppe	University of Rome La Sapienza	56667
79	Fantuzzi, Nicholas	University of Bologna	57076
80	Vegliò, Francesco	University of L'Aquila	57680
81	Saponara, Sergio	University of Pisa	58828
82	Tomei, Patrizio	University of Rome Tor Vergata	59311
83	Zaccarian, Luca	University of Trento	60297
84	Bartolini, Giorgio	CNR	60470
85	Di Sciuva, Marco	Politecnico di Torino	60952
86	Laschi, Cecilia	Scuola Superiore Sant'Anna	61169
87	Carbone, G.	Politecnico di Bari	61320
88	Garzelli, Andrea	University of Siena	62029
89	Bottani, Eleonora	University of Parma	62284
90	Cascini, Leonardo	Universita di Salerno	62438
91	Bigoni, D.	University of Trento	62691

92	Grisetti, Giorgio	University of Rome La Sapienza	63069
93	Martorella, Marco	University of Pisa	63289
94	Lacarbonara, Walter	University of Rome La Sapienza	63318
95	Andreozzi, Roberto	University of Naples Federico II	63532
96	Di Gennaro, S.	University of L'Aquila	64693
97	Guagliano, M.	Politecnico di Milano	64840
98	Lenzi, M.A.	University of Padova	65734
99	Carrozza, Maria Chiara	Scuola Superiore Sant'Anna	68081
100	Maier, G.	Politecnico di Milano	68113
101	Buja, Giuseppe	University of Padova	68566
102	Asinari, Pietro	Politecnico di Torino	68761
103	Vitelli, M.	Second University of Naples	69237
104	Baino, Francesco	Politecnico di Torino	70556
105	Morini, Gian Luca	University of Bologna	70691
106	Chiuso, Alessandro	University of Padova	70990
107	Marotti de Sciarra, Francesco	University of Naples Federico II	71110
108	Giustolisi, Orazio	University of Bari	71526
109	Saracco, Guido	Politecnico di Torino	72245
110	Savaresi, Sergio M.	Politecnico di Milano	72883
111	Brocca, Luca	CNR	73027
112	Marchisio, Daniele L.	Politecnico di Torino	73102
113	Bernardo, Paola	University of Calabria	73376
114	Giorgio, Ivan	University of Rome La Sapienza	74706
115	Martello, Silvano	University of Bologna	75591
116	Luchini, Paolo	Universita di Salerno	76707
117	Cavagnino, Andrea	Politecnico di Torino	77237
118	Cecati, Carlo	University of L'Aquila	78111
119	Lorenzini, Giulio	University of Parma	78287
120	Bittelli, Marco	University of Bologna	78301
121	Tanda, Giovanni	University of Genoa	78953
122	Pisano, Alessandro	University of Cagliari	79118
123	Colaneri, Patrizio	Politecnico di Milano	79160
124	Ridolfi, Luca	Politecnico di Torino	79330
125	Casadei, Domenico	University of Bologna	80794
126	Lazzarin, Renato M.	University of Padova	81086
127	Pook, L.P.	University of Cassino	81172
128	Vanham, D.	Joint Research Centre of Ispra	81947
129	de Roo, Ad	Joint Research Centre of Ispra	81997
130	Melchiorri, Claudio	University of Bologna	82404
131	Barletta, A.	University of Bologna	82870
132	Salvadori, G.	University of Lecce	82932
133	Ciardelli, Gianluca	Politecnico di Torino	83805
134	Di Paola, Mario	Universita di Palermo	84008
135	D'Anna, Andrea	University of Naples Federico II	84138
136	Del Col, Davide	University of Padova	85031
137	Alparone, Luciano	University of Florence	85227
138	Benini, Ernesto	University of Padova	85281

139	Curcio, Efrem	University of Calabria	85452
140	Magni, Lalo	University of Pavia	86601
141	Brighenti, Roberto	University of Parma	87759
142	Ceraolo, Massimo	University of Pisa	88085
143	Cassano, Alfredo	University of Calabria	88221
144	Bojoi, R.	Politecnico di Torino	88460
145	Femia, N.	Universita di Salerno	88479
146	Achard, Frédéric	Joint Research Centre of Ispra	89837
147	Pennacchi, Paolo	Politecnico di Milano	89962
148	Fiori, Luca	University of Trento	89988
149	Battistelli, Giorgio	University of Florence	90722
150	Ferrara, Antonella	University of Pavia	91203
151	Castellarin, Attilio	University of Bologna	91737
152	Facchinei, Francisco	University of Rome La Sapienza	92464
153	Franceschetti, Giorgio	University of Naples Federico II	92962
154	Menciassi, Arianna	Scuola Superiore Sant'Anna	93130
155	Vigo, Daniele	University of Bologna	94971
156	Petrone, G.	Universita di Salerno	95509
157	Spagnuolo, G.	Universita di Salerno	95677
158	Sergeyev, Yaroslav D.	University of Calabria	95765
159	Cavallini, Alberto	University of Padova	96973
160	Senneca, Osvalda	CNR	97614
161	Foti, Dora	University of Bari	98087
162	Pellegrino, Gianmario	Politecnico di Torino	98355
163	Fragiacomo, Massimo	University of L'Aquila	98906
164	Speranza, M. Grazia	University of Brescia	98936
165	Ambrosi, D.	Politecnico di Milano	100196
166	Quaresimin, M.	University of Padova	100978
167	Mazzolani, F.M.	University of Naples Federico II	101442
168	Andò, Bruno	University of Catania	103117
169	Cimellaro, Gian Paolo	Politecnico di Torino	103185
170	Ferro, Vito	Universita di Palermo	103429
171	Brunone, Bruno	University of Perugia	104779
172	Cipriani, Christian	Scuola Superiore Sant'Anna	105944
173	Pillonetto, Gianluigi	University of Padova	106772
174	Pellicano, Francesco	University of Modena and Reggio Emilia	108755
175	Cristofolini, Luca	University of Bologna	109385
176	Manzini, Riccardo	University of Bologna	110789
177	Lenci, Stefano	Universita Politecnica delle Marche	110958
178	Fiori, A.	Universita Roma Tre	114022
179	Piccardo, Giuseppe	University of Genoa	114743
180	Frangioni, Antonio	University of Pisa	114778
181	Giua, Alessandro	University of Cagliari	115428
182	Cardone, Donatello	Universita della Basilicata	116589
183	Cazzani, Antonio	University of Cagliari	119420
184	Ubertini, Filippo	University of Perugia	127934
185	Botter, Gianluca	University of Padova	129338

186	Turco, Emilio	University of Sassari	133199
187	Feo, Luciano	Universita di Salerno	135358
188	Pellegrino, Carlo	University of Padova	138115
189	Stoller, Marco	University of Rome La Sapienza	143097
190	D'Amato, Maurizio	Politecnico di Bari	150967
191	Maione, Guido	Politecnico di Bari	151374
192	Montuori, Rosario	Universita di Salerno	156931
193	Mélin, Frédéric	Joint Research Centre of Ispra	162893
194	Faes, Luca	University of Trento	164089
195	Pepe, Pierdomenico	University of L'Aquila	171047
196	Cinefra, M.	Politecnico di Torino	182330
197	Meneghetti, G.	University of Padova	183948
198	Pappalardo, Carmine M.	Universita di Salerno	204501
199	Affatato, Saverio	Istituti Ortopedici Rizzoli, Bologna	205812
200	Carloni, Christian	University of Bologna	209594
201	Rionero, Salvatore	University of Naples Federico II	213665
202	Ruggeri, Tommaso	University of Bologna	223746
203	Vezzetti, Enrico	Politecnico di Torino	279165
204	Minelli, Matteo	University of Bologna	398446

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Top Apulia Scientists in the **All Areas** from **Career 1996-2018 (23 years)**.

N	Name	University	Rank C	Academic years
1	Ribatti, Domenico	University of Bari	2685	40
2	Schena, Francesco Paolo	University of Bari	12375	52
3	Palmieri, Ferdinando	University of Bari	15671	58
4	Senesi, Nicola	University of Bari	18154	43
5	Gasperini, M.	University of Bari	18855	42
6	Logroscino, Giancarlo	University of Bari	20170	36
7	Frampton, Paul H.	University of Salento	23755	53
8	Lo Muzio, Lorenzo	University of Foggia	33094	34
9	Dantas-Torres, Filipe	University of Bari	33138	15
10	Tornabene, Francesco	University of Salento	36312	16
11	Strippoli, Giovanni F.M.	University of Bari	41973	20
12	Otranto, Domenico	University of Bari	45031	22
13	Dammacco, Franco	University of Bari	46779	57
14	Storelli, Maria M.	University of Bari	48526	22
15	Cotecchia, Susanna	University of Bari	58292	37
16	Ciavarella, Michele	Polytechnic University of Bari	63403	23
17	Mascolo, Saverio	Polytechnic University of Bari	64609	25
18	Cavaliere, Pasquale	University of Salento	67757	20
19	Fogli, Gianluigi	Istituto Nazionale di Fisica Nucleare, Bari	69439	37
20	De Pergola, Giovanni	University of Bari	72622	42
21	Lancioni, Giulio E.	University of Bari	74743	40
22	Trojano, Maria	University of Bari	78516	42
23	Vacca, Angelo	University of Bari	80848	37
24	Del Nobile, Matteo Alessandro	University of Foggia	89753	31
25	Cicinelli, Ettore	University of Bari	92426	37
26	Saccone, Cecilia	University of Bari	93591	60
27	Paradies, Giuseppe	University of Bari	94378	52
28	Portincasa, Piero	University of Bari	95957	37
29	d'Agostino, Riccardo	University of Bari	96923	44
30	Zallone, Alberta	University of Bari	99052	51
31	Martelli, Giovanni P.	University of Bari	103701	53
32	Giangrande, Adriana	University of Salento	116189	39
33	Ciufolini, Ignazio	University of Salento	118379	32
34	Parise, Mario	University of Bari	125610	24
35	Bozzini, Benedetto	University of Salento	165897	30
36	Kanduc, Darja	University of Bari	220534	49

* Reference: Ioannidis JPA, Baas J, Klavans R, Boyack KW (2019), *A Standardized Citation Metrics Author Database Annotated for Scientific Field*, **PLoS Biol 17(8)**: e3000384. https://doi.org/10.1371/journal.pbio.3000384

Top Apulia Scientists in the **All Areas** from **Career 1996-2017 (22 years)**.

N	Name	University	Rank C	Academic years
1	Ribatti, Domenico	University of Bari	2767	39
2	Palmieri, Ferdinando	University of Bari	15393	57
3	Senesi, Nicola	University of Bari	18882	40
4	Frampton, Paul H.	University of Lecce	21534	52
5	Logroscino, Giancarlo	University of Bari	24702	35
6	Lo Muzio, Lorenzo	University of Foggia	31885	23
7	Pesole, Graziano	University of Bari	38213	31
8	Dammacco, Franco	University of Bari	38702	56
9	Iorio, Lorenzo	University of Bari	46006	17
10	Boero, Ferdinando	University of Lecce	48045	39
11	Otranto, Domenico	University of Bari	49235	21
12	Paradies, Giuseppe	University of Bari	50625	51
13	Storelli, M.M.	University of Bari	51993	22
14	Cotecchia, Susanna	University of Bari	52757	37
15	Mascolo, Saverio	Politecnico di Bari	58634	24
16	Tornabene, Francesco	University of Bologna	65632	15
17	Ciavarella, M.	Politecnico di Bari	66165	22
18	Lancioni, Giulio E.	University of Bari	66343	39
19	De Pergola, Giovanni	University of Bari	67260	41
20	Cavaliere, P.	University of Lecce	69050	19
21	Vacca, Angelo	University of Bari	74252	35
22	Saccone, Cecilia	University of Bari	74944	53
23	Trojano, Maria	University of Bari	79873	41
24	Konopelchenko, B.G.	University of Lecce	81828	44
25	Torsi, Luisa	University of Bari	85488	29
26	Cicinelli, Ettore	University of Bari	90409	36
27	Margaglione, Maurizio	University of Foggia	92461	30
28	Del Nobile, M.A.	University of Foggia	93552	30
29	D'Agostino, Riccardo	University of Bari	94722	43
30	Portincasa, Piero	University of Bari	100202	36
31	Giangrande, Adriana	University of Lecce	123139	36
32	Ciufolini, Ignazio	University of Lecce	127721	36
33	Beccaria, Matteo	University of Lecce	132027	27
34	Bozzini, Benedetto	University of Lecce	156826	29
35	Kanduc, Darja	University of Bari	225914	47
36	Ribatti, Domenico	University of Bari	2767	39

* Reference: Ioannidis JPA, Baas J, Klavans R, Boyack KW (2019), *A Standardized Citation Metrics Author Database Annotated for Scientific Field*, **PLoS Biol 17(8)**: e3000384. https://doi.org/10.1371/journal.pbio.3000384

Top Apulia Scientists in the **All Areas** from **Single Year Career 2017 (single year)**.

N	Name	University	Rank C
1	Ribatti, Domenico	University of Bari	2743
2	Tornabene, Francesco	University of Bologna	4769
3	Logroscino, Giancarlo	University of Bari	8004
4	Otranto, Domenico	University of Bari	19302
5	Palmieri, Ferdinando	University of Bari	19625
6	Senesi, Nicola	University of Bari	26113
7	Maniglio, Roberto	University of Lecce	26816
8	Iorio, Lorenzo	University of Bari	32724
9	Panza, Francesco	University of Bari	33109
10	Boero, Ferdinando	University of Lecce	35854
11	Lionello, Piero	University of Lecce	38235
12	Pesole, Graziano	University of Bari	40046
13	Lo Muzio, Lorenzo	University of Foggia	42379
14	Storelli, M.M.	University of Bari	44432
15	Solfrizzi, Vincenzo	University of Bari	49043
16	Cavaliere, P.	University of Lecce	52659
17	Frampton, Paul H.	University of Lecce	53383
18	Ciavarella, M.	Politecnico di Bari	55651
19	Trojano, Maria	University of Bari	57415
20	Dammacco, Franco	University of Bari	59034
21	Paradies, Giuseppe	University of Bari	59309
22	Carbone, G.	Politecnico di Bari	61320
23	De Angelis, Maria	University of Bari	62451
24	Petruzzelli, Antonio Messeni	Politecnico di Bari	65996
25	Lancioni, Giulio E.	University of Bari	67224
26	Del Nobile, M.A.	University of Foggia	69771
27	Torsi, Luisa	University of Bari	70720
28	Simone, Cristiano	University of Bari	71126
29	Giustolisi, Orazio	University of Bari	71526
30	Martella, Vito	University of Bari	76022
31	Dibenedetto, Angela	University of Bari	76193
32	Casalino, G.	Politecnico di Bari	77762
33	De Pergola, Giovanni	University of Bari	78371
34	Garrappa, Roberto	University of Bari	82799
35	Salvadori, G.	University of Lecce	82932
36	Fimia, Gian Maria	University of Lecce	83294
37	Cafagna, Donato	University of Lecce	85238
38	Vacca, Angelo	University of Bari	87334
39	Moschetta, Antonio	University of Bari	88515
40	Portincasa, Piero	University of Bari	89009
41	Decaro, Nicola	University of Bari	89654
42	Lattanzio, Vincenzo	University of Foggia	91800
43	Santamaria, Pietro	University of Bari	93390
44	Giangrande, Adriana	University of Lecce	95031

45	Mantriota, Giacomo	Politecnico di Bari	96105
46	Baiano, Antonietta	University of Foggia	96901
47	Rizzello, Carlo Giuseppe	University of Bari	97432
48	Foti, Dora	University of Bari	98087
49	Buonavoglia, Canio	University of Bari	99403
50	Albino, Vito	Politecnico di Bari	99425
51	Clodoveo, Maria Lisa	University of Bari	101739
52	Defazio, Giovanni	University of Bari	105041
53	Palazzo, Gerardo	University of Bari	107081
54	Martelli, G.P.	University of Bari	110319
55	De Giacomo, A.	University of Bari	114563
56	De Tommaso, Marina	University of Bari	122287
57	Brogi, Andrea	University of Bari	122924
58	Messina, Giovanni	University of Foggia	145986
59	D'Amato, Maurizio	Politecnico di Bari	150967
60	Maione, Guido	Politecnico di Bari	151374
61	Durante, Fabrizio	University of Lecce	166464

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COMMUNITY PAGE

A standardized citation metrics author database annotated for scientific field

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Abstract

Citation metrics are widely used and misused. We have created a publicly available database of 100,000 top scientists that provides standardized information on citations, h-index, coauthorship-adjusted hm-index, citations to papers in different authorship positions, and a composite indicator. Separate data are shown for career-long and single-year impact. Metrics with and without self-citations and ratio of citations to citing papers are given. Scientists are classified into 22 scientific fields and 176 subfields. Field- and subfield-specific percentiles are also provided for all scientists who have published at least five papers. Career-long data are updated to end of 2017 and to end of 2018 for comparison.

Use of citation metrics has become widespread but is fraught with difficulties. Some challenges relate to what citations and related metrics fundamentally mean and how they can be interpreted or misinterpreted as a measure of impact or excellence [1]. Many other problems are of a technical nature and reflect lack of standardization and accuracy on various fronts. Several different citation databases exist, many metrics are available, users mine them in different ways, self-reported data in curriculum vitae documents are often inaccurate and not professionally calculated, handling of self-citations is erratic, and comparisons between scientific fields with different citation densities are tenuous. To our knowledge, there is no large-scale database that systematically ranks all the most-cited scientists in each and every scientific field to a sufficient ranking depth; e.g., Google Scholar allows scientists to create their profiles and share them in public, but not all researchers have created a profile. Clarivate Analytics provides every year a list of the most-cited scientists of the last decade, but the scheme uses a coarse classification of science in only 21 fields, and even the latest, expanded listing includes only about 6,000 scientists (https://hcr.clarivate.com/worlds-influential-scientific-minds), i.e., less than 0.1% of the total number of people coauthoring scholarly papers. Moreover, self-citations are not excluded in these existing rankings.

We have tried to offer a solution to overcome many of the technical problems and provide a comprehensive database of a sufficiently large number of most-cited scientists across science.

Here, we used Scopus data to compile a database of the 100,000 most-cited authors across all scientific fields based on their ranking of a composite indicator that considers six citation metrics (total citations; Hirsch h-index; coauthorship-adjusted Schreiber hm-index; number of citations to papers as single author; number of citations to papers as single or first author; and number of citations to papers as single, first, or last author) [2].

The methodology behind the composite indicator has been already extensively described along with its strengths and residual caveats in [2]. We offer two versions of the database. One version (supplementary Table S1, http://dx.doi.org/10.17632/btchxktzyw.1#file-ad4249ac-f76f-4653-9e42-2dfebe5d9b01) is calculated using Scopus citation data over 22 years (from January 1, 1996 until December 31, 2017; complete data for 2018 will not be available until later in 2019). For papers published from 1960 until 1995, the citations received in 1996–2017 are also included in the calculations, but the citations received up to 1995 are not. Therefore, this version provides a measure of long-term performance, and for most living, active scientists, this also reflects their career-long impact or is a very good approximation thereof. In order to assess the robustness and validity of the calculations, they have been replicated on a second, independent platform and a data set with a slightly different timestamp (less than one month difference). Correlations between the two independent calculations for the composite indicator ($r = 0.983$) and number of papers ($r = 0.991$) for the top 1,000,000 authors confirm the calculations are accurate and stable.

The other version (supplementary Table S2, http://dx.doi.org/10.17632/btchxktzyw.1#file-b9b8c85e-6914-4b1d-815e-55daefb64f5e) is calculated using data for citations in a single calendar year, 2017. It provides a measure of performance in that single recent year. Therefore, it removes the bias that may exist in comparing scientists with long accrual of citations over many years of active work versus younger ones with shorter time frame during which they may accumulate citations because it focuses on citation accrual only during a single year.

The constructed database shows, for each scientist, the values for each of the six metrics that are used in the calculation of the composite as well as the composite indicator itself, and all indicators are given with and without self-citations. Institutional affiliation and the respective country are inferred based on most recent publications according to the Scopus data as of May 2018. Therefore, only one affiliation is provided even though scientists may have worked in several institutions. Nevertheless, all their work in different institutions is all captured within their author record.

Extreme self-citations and "citation farms" (relatively small clusters of authors massively citing each other's papers) make citation metrics spurious and meaningless, and we offer ways to identify such cases. We provide data that exclude self-citations to a paper by any author of that paper and, separately, data including all citations, e.g., if a paper has 12 authors and it has received 102 citations, but 24/102 have as a (co)author at least one of these 12 authors of the original paper, only $102 - 24 = 78$ citations are counted. Among the top 100,000 authors for 1996–2017 data, the median percentage of self-citations is 12.7%, but it varies a lot across scientists (interquartile range, 8.6%–17.7%, full range 0.0%–93.8%). Among the top 100,000 authors for the 2017 single-year data, the median percentage of self-citations is 9.2% (interquartile range, 4.8%–14.7%, full range 0.0%–98.6%). With very high proportions of self-citations, we would advise against using any citation metrics since extreme rates of self-citation may herald also other spurious features. These need to be examined on a case-by-case basis for each author, and simply removing the self-citations may not suffice [3]. Indicatively, among the top 100,000 authors for 1996–2017 and 2017-only data, there are 1,085 and 1,565 authors, respectively, who have >40% self-citations, while 8,599 and 8,534 authors, respectively, have >25% self-citations.

We also provide data on the number of citing papers and on the ratio of citations divided by the number of citing papers. 5,709 authors in the career-long data set and 7,090 in the single-year data set have a ratio over 2. High ratios deserve more in-depth assessment of these authors. Sometimes, this may reflect that it is common for a small number of papers of the same author to be cited together. Alternatively, they may point to situations of spurious "citation farms."

For each scientist, we provide the most common scientific field and the two most common scientific subfields of his/her publications, along with the percentage for each. All science is divided into 22 large fields (e.g., Clinical Medicine, Biology), and these are further divided into 176 subfields according to the Science-Metrix journal classification system [4] (http://science-metrix.com/?q=en/classification). Thus, users can rank scientists according to each of the six metrics or the composite indicator and can limit the ranking to scientists with similar scientific field or top subfield for different levels of desired similarity.

A separate file (supplementary Table S3, http://dx.doi.org/10.17632/btchxktzyw.1#file-e30a1e62-daf4-49f1-b1ca-484a979f6500) lists the total number of authors in Scopus who have published at least five papers and breaks this down by their most common area of publications (for the 22 fields and 176 subfields mentioned above). A total of 6,880,389 scientists have published at least five papers. Because each of the top 100,000 authors can be assigned to the most common field or subfield to which his/her work belongs, a ranking can be obtained among authors assigned to the same main area based on what journals they publish in; e.g., suppose a scientist is ranked 256 in some particular metric among the 120,051 scientists in the subfield of immunology. Therefore, the scientist is in the top 0.21% (256/120,051) of authors by that metric in immunology.

For all 6,880,389 scientists, Table 1 shows the career-long 25th, 50th, 75th, and 90th percentile of total citations and composite citation index according to each of the 22 fields. Table S3 provides the same information (along with 95th and 99th percentiles) for each of the 176 subfields as well. Thus, one can see the relative citation density of different fields. Moreover, any scientist who has published at least five papers can be ranked against these standard percentiles in his/her field or subfield based on his/her citation data from Scopus.

Existing ranking systems typically focus on single fields (e.g., ranking of authors in economics is performed by https://ideas.repec.org/top/) and use numbers of papers and total citations rather than multiple metrics. They also do not account for self-citation phenomena. Nevertheless, our databases still have limitations that have been discussed in detail previously in describing the methodology behind the composite indicator [2]. We should also caution again that citations from before 1996 are missing from our analysis. Overall, whole-career metrics place young scientists at a disadvantage. Single-year metrics remove much of this problem, although again, younger scientists have fewer years of publication history and thus probably fewer papers that can be cited in 2017. We have included the year of first (earliest) publication and the year of last (more recent) indexed publication of each author.

Publications of the scientists are extracted from the Scopus database using the author profiles, which are formed by a combination of curated profiles and profiles generated by an "author profiling" algorithm [5]. The reported precision and recall by Scopus in 2017 was 98% precision (i.e., on average, 98% of publications merged in a profile belong to one and the same person) at an average recall of 93.5% (i.e., on average, 93.5% of all publications of the same person are merged into one profile); the evaluation used a manual assessment of a sample of >6,000 authors for which the full publication history was collected and compared to what is available in the Scopus profiles. The precision/recall is higher as of April, 2019 at 99.9% and >94%, and the gold set used is also larger now, with >10,000 author records. Nevertheless, a few scientists still have their work split into multiple author records in Scopus; however, even

Table 1. Percentiles of total citations and composite citation metric for each of 22 large scientific fields, career-long data (citations from 1996–2017). Total citations include self-citations.

Scientific field	Authors	Percentile, total citations				Percentile, composite index			
		25th	50th	75th	90th	25th	50th	75th	90th
Agriculture, Fisheries, & Forestry	232,801	32	90	255	671	0.997	1.418	1.892	2.394
Built Environment & Design	36,534	17	51	143	370	0.953	1.344	1.821	2.335
Enabling & Strategic Technologies	475,142	23	75	233	678	0.890	1.330	1.807	2.300
Engineering	436,723	18	56	174	499	0.896	1.316	1.794	2.314
Information & Communication Technologies	339,284	20	60	193	574	0.970	1.380	1.862	2.383
Communication & Textual Studies	20,292	12	32	91	240	1.141	1.542	1.995	2.430
Historical Studies	25,277	16	40	105	263	1.138	1.568	2.012	2.429
Philosophy & Theology	13,861	12	32	87	217	1.145	1.558	2.003	2.453
Visual & Performing Arts	3,717	7	17	40	83	0.985	1.316	1.680	1.998
Economics & Business	108,277	28	83	258	708	1.191	1.651	2.194	2.730
Social Sciences	119,260	20	56	158	423	1.159	1.606	2.114	2.615
General Science & Technology	69,789	14	41	122	399	0.735	1.030	1.392	1.760
General Arts, Humanities, & Social Sciences	4,091	11	28	70	158	1.026	1.403	1.810	2.192
Biomedical Research	626,753	68	212	641	1,769	1.095	1.598	2.111	2.660
Clinical Medicine	2,113,734	41	141	467	1,430	0.935	1.420	1.979	2.568
Psychology & Cognitive Sciences	96,159	41	128	403	1,198	1.189	1.641	2.198	2.842
Public Health & Health Services	141,162	31	92	273	785	0.988	1.427	1.949	2.520
Biology	236,108	47	140	426	1,178	1.151	1.603	2.125	2.686
Chemistry	506,526	45	129	362	989	1.057	1.503	1.967	2.467
Earth & Environmental Sciences	223,246	40	126	405	1,192	1.096	1.562	2.120	2.709
Mathematics & Statistics	96,619	18	52	162	457	1.049	1.503	2.059	2.596
Physics & Astronomy	667,255	38	128	480	1,741	1.022	1.495	2.042	2.615
Unassigned*	287,779	2	7	18	42	0.463	0.672	0.985	1.302
TOTAL	6,880,389	29	102	346	1,077	0.946	1.420	1.951	2.513

In order to calculate the c (composite) indicator, any scientist may use the formula $c = \frac{\ln(nc9617+1)}{\ln(nc9617max+1)} + \frac{\ln(h17+1)}{\ln(h17max+1)} + \frac{\ln(hm17+1)}{\ln(hm17max+1)} + \frac{\ln(ncs+1)}{\ln(ncsmax+1)} + \frac{\ln(ncsf+1)}{\ln(ncsfmax+1)} + \frac{\ln(ncsfl+1)}{\ln(ncsflmax+1)}$, where nc9617 is the total number of citations, h17 is the h-index, hm17 is the Schreiber coauthorship-adjusted hm index, ncs is the number of citations to papers as a single author, ncsf is the number of citations to papers as single or first author, and ncsfl is the number of citations to papers as single, first, or last author. The maximum values for these components of the composite indicator are nc9617max = 259,310, h17max = 222, hm17max = 103.9811, ncsmax = 135,334, ncsfmax = 149,125, and ncsflmax = 163,476. For the same percentiles on career-long total citation and composite indicator data split according to 176 subfields, see Table S3.

*Unassigned scientists have no published items that can be assigned to any field. Typically, they have published very few items, and these may be in conference proceedings or journals that are not included in the Science-Metrix classification system.

The data in the Table include all authors who have published at least five items that are classified by Scopus as "Articles," "Reviews," or "Conference Papers."

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then, one record usually carries the lion's share of citations. We examined in depth a random sample of 500 author records among the top 1,000,000 records according to the 1996–2017 composite indicator, and we found 13 authors who had been split into two records each. It is possible that the most-cited/most-productive authors may have a higher chance of having split records. Among the top 150 in terms of composite indicator for 1996–2017, we found 20 who had two records and three who had three records among the top 1,000,000 records. However, in all cases, the top record captured the large majority of the citations, and for 11/23, the extra record(s) were not even among the top 100,000. Some other scientists with the same name may have been merged in the same record, but overall, disambiguation in Scopus has improved markedly in this regard, and major errors of this sort are currently very uncommon. They may be more common still for some Chinese and Korean names. Inappropriate merging

may also be suspected when the top subfields are not contiguous, e.g., diabetes and particle physics.

Some citation indicators such as the h-index are highly popular, but all single indicators have shortcomings. For practical purposes, it is usually desirable to have a set of bibliometric indicators, each emphasizing a different aspect of the scientific impact of a scientist [6]. We offer the means to practice routinely such an approach. Of note, the six components of the composite indicator are not orthogonal but have correlations among themselves. Some bibliometrics experts may not favor composites that include correlated metrics and may prefer to inspect each one of them independently. Our databases also allow this approach.

The data sets that we provide also allow placing scientists in reference standards of almost two hundred fields. Still, some scientists may work in very small sub-subfields that may have different citation densities. Moreover, for very early career scientists, any citation metrics would have limited use since these researchers may not have published much yet and their papers would not have time to accrue citations.

A citation database is most useful when it can be regularly updated. We also provide here data that have been updated with an annual interval. We repeated the same exact analyses for career-long data until the end of 2018 (as opposed to the end of 2017) using a timestamped Scopus data set released on April 22, 2019. The data on the top-100,000–ranked scientists are provided in supplementary Table S4 (http://dx.doi.org/10.17632/btchxktzyw.1#file-bade950e-3343-43e7-896b-fb2069ba3481). As one can see, the correlation between the two data sets is extremely high, and the vast majority of scientists do not change their ranking much. As an illustrative example, supplementary Table S5 (http://dx.doi.org/10.17632/btchxktzyw.1#file-5d904ef8-fc87-4dbf-aaa7-ad33db9ac561) provides the ranking for a random sample of 100 authors sampled from those who were in the top 100,000 based on the composite index excluding self-citations. 93 of the 100 were among the top 100,000 in both assessments. Another five were very close to the top 100,000 with one assessment and at the lower end of the top 100,000 in the other assessment. Another two with modestly larger differences still did not shift by much in terms of their percentile ranking across all authors, with changes of 1% and 2% on the percentile ranking, respectively. Both of these changes were due to corrections in which papers are included in the author record rather than simply accrual of citations. For the vast majority of scientists, it is likely that percentile ranking may take many years to change substantially; therefore, the current databases that we have compiled can be used meaningfully for several years by the wider community before a new update is needed. We provide the databases as spreadsheets in Mendeley Data for entirely open, free public use. Instead of creating a formulaic website, spreadsheets can be downloaded, searched, and tailored for analyses by scientists in whatever fashion they prefer. Moreover, the percentile information could be used for placing a field-specific ranking for any scientist, not just the top 100,000.

We hope that the availability of standardized, field-annotated data will help achieve a more nuanced use of metrics, avoiding some of the egregious errors of raw bean-counting that are prevalent in misuse of citation metrics. Citation metrics should be used in a more systematic, less error-prone and more relevant, context-specific, and field-adjusted way and also allowing for removal of self-citations and detection of citation farms.

Citation analyses for individuals are used for various single-person or comparative assessments in the complex reward and incentive system of science [7]. Misuse of citation metrics in hiring, promotion or tenure decision, or other situations involving rewards (e.g., funding or awards) takes many forms, including but not limited to the use of metrics that are not very informative for scientists and their work (e.g., journal impact factors); focus on single citation metrics (e.g., h-index); and use of calculations that are not standardized, use different frames, and do not account for field. The availability of the data sets that we provide should help

mitigate many of these problems. The database can also be used to perform evaluations of groups of individuals, e.g., at the level of scientific fields, institutions, countries, or memberships in diversely defined groups that may be of interest to users. Linkage to other author-based databases in the future may enhance the potential for further use in meta-research evaluations [8]. We discourage raw comparisons of scientists across very different fields. We cannot emphasize enough that use of these metrics needs to be prudent. Authors who detect errors in the entered data should contact Scopus to correct the respective entries and author records. We also welcome suggestions for more generic improvements that may augment the utility of the shared resource that we have generated.

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