REPORTING SESSION

Institute of Physics
Polish Academy of Sciences
Research Activity in 2019
SUMMARY

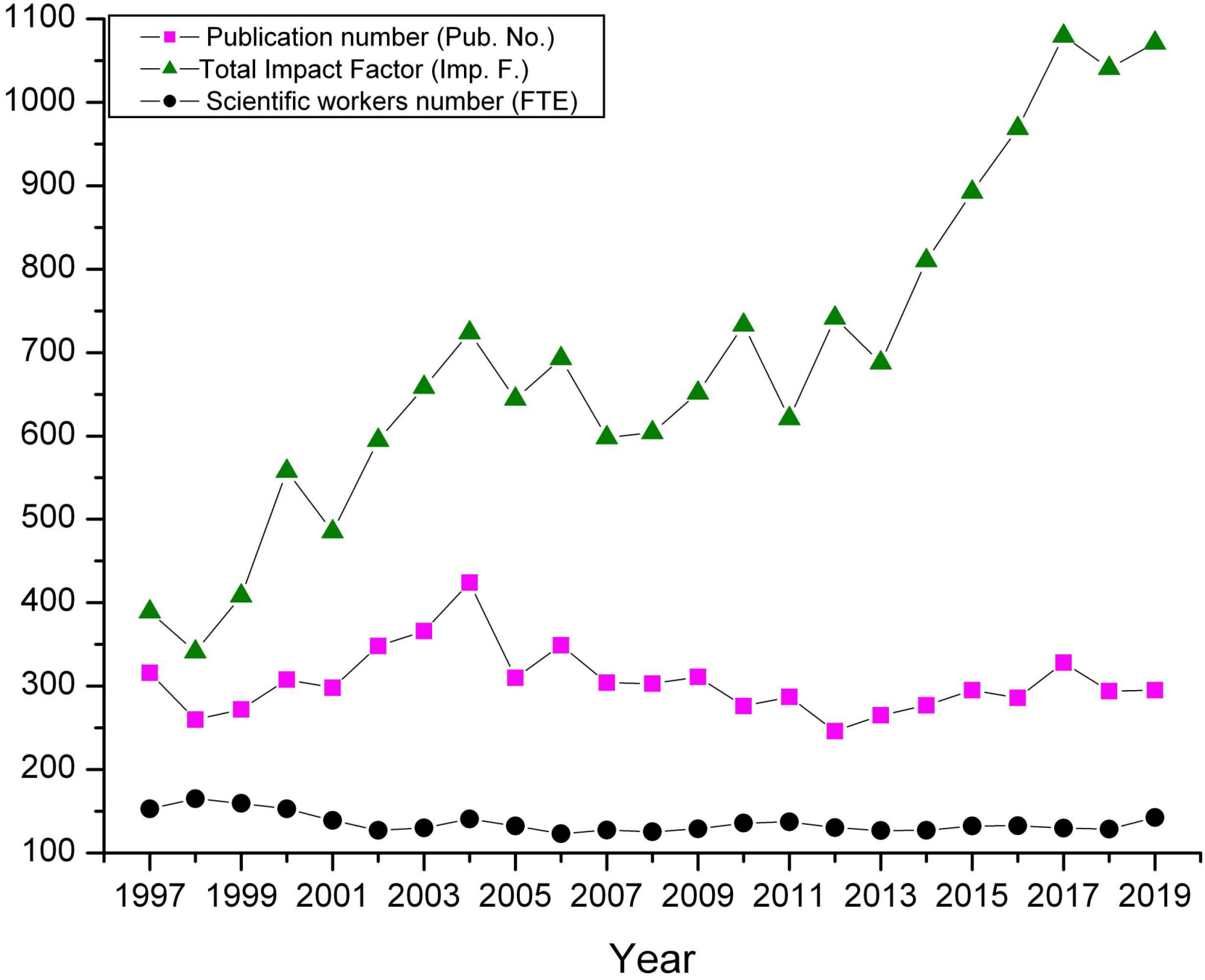
Publications in 2019

index	TOGETHER	IF ≥ 5	IF ≥ 3	IF ≥ 2
Number of publications with Impact Factor, IF > 0 („z listy filadelfijskiej”)	295 (299)	37	135	233
Other publications (IF=0, ministerial points > 0)	13	Sum of IFs = 1071,18		

Total number of employees in research (people who declared research discipline)	269 (31.12.19)
No. of publications per employee	1.14

Grey numbers indicate analogical values for year 2018

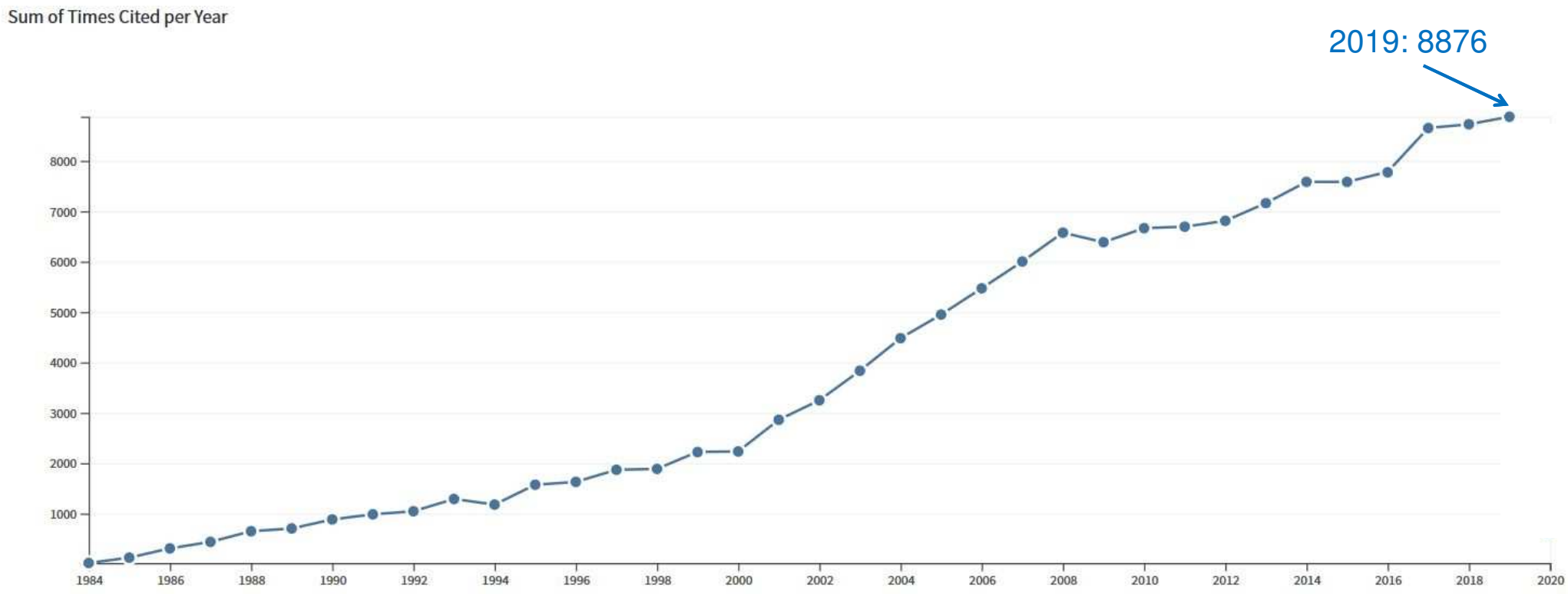
IF PAN: publication trends



Citation number (Web of Science)

Authors from IF PAN cited ≥100 times in 2019	50 (41)

Grey numbers indicate analogical values for year 2018



Hirsch index of IF PAN = 125

9 highest ranked publications (IF > 10)

1. Rechcińska K. , Król M. , Mazur R. , Morawiak P. , Mirek R. , Łempicka K. , Bardyszewski W. , **Matuszewski M**. Kula P. , Piecek W. , Lagoudakis P. , Piętka B. , Szczytko J., *Engineering spin-orbit synthetic Hamiltonians in liquid-crystal optical cavities*, Science **366,** 727-730 (2019) (IF = 41,037).

2. Caputo D. , **Bobrovska N.** , Ballarini D. , **Matuszewski M.** , De Giorgi M. , Dominici L. , West K. , Pfeiffer L. , Gigli G. , Sanvitto D., *Josephson vortices induced by phase twisting a polariton superfluid*, Nature Photonics **13,** 488-493 (2019) (IF = 31,583).

3. Ziv A. , Saha A. , Alpern H. , Sukenik N. , **Baczewski L**. , Yochelis S. , Reches M. , Paltiel Y., *AFM-Based Spin-Exchange Microscopy Using Chiral Molecules,* Advanced Materials **31**, 1904206**,** (2019) (IF = 25,809).

4. **Sowiński T.** , Garcia-March M., *One-dimensional mixtures of several ultracold atoms: a review*, Reports on Progress in Physics **82**, 104401-104447 (2019) (IF = 16,62).

5. Berenbeim J. , Boldissar S. , Owens S. , Haggmark M.R. , Gate G. , Siouri F.M. , Cohen T. , **Rode M.F.** , Schmidt-Patterson C. , De Vries M.S., *Excited state intramolecular proton transfer in hydroxyanthraquinones: Toward predicting fading of organic red colorants in art.*, Science Advances **5**, 5227 (2019) (IF = 12,804).

6. Baranowski M. , Galkowski K. , Surrente A. , Urban J. , **Kłopotowski Ł**. , Maćkowski S. , Maude D.K. , Aich R. , Boujdaria K. , Chamarro M. , Testelin C. , Nayak P. , Dollmann M. , Snaith H. , Nicholas R. , Płochocka P., *Giant Fine Structure Splitting of the Bright Exciton in a Bulk MAPbBr3 Single Crystal*, Nano Letters **19**, 7054-7061 (2019) (IF = 12,279).

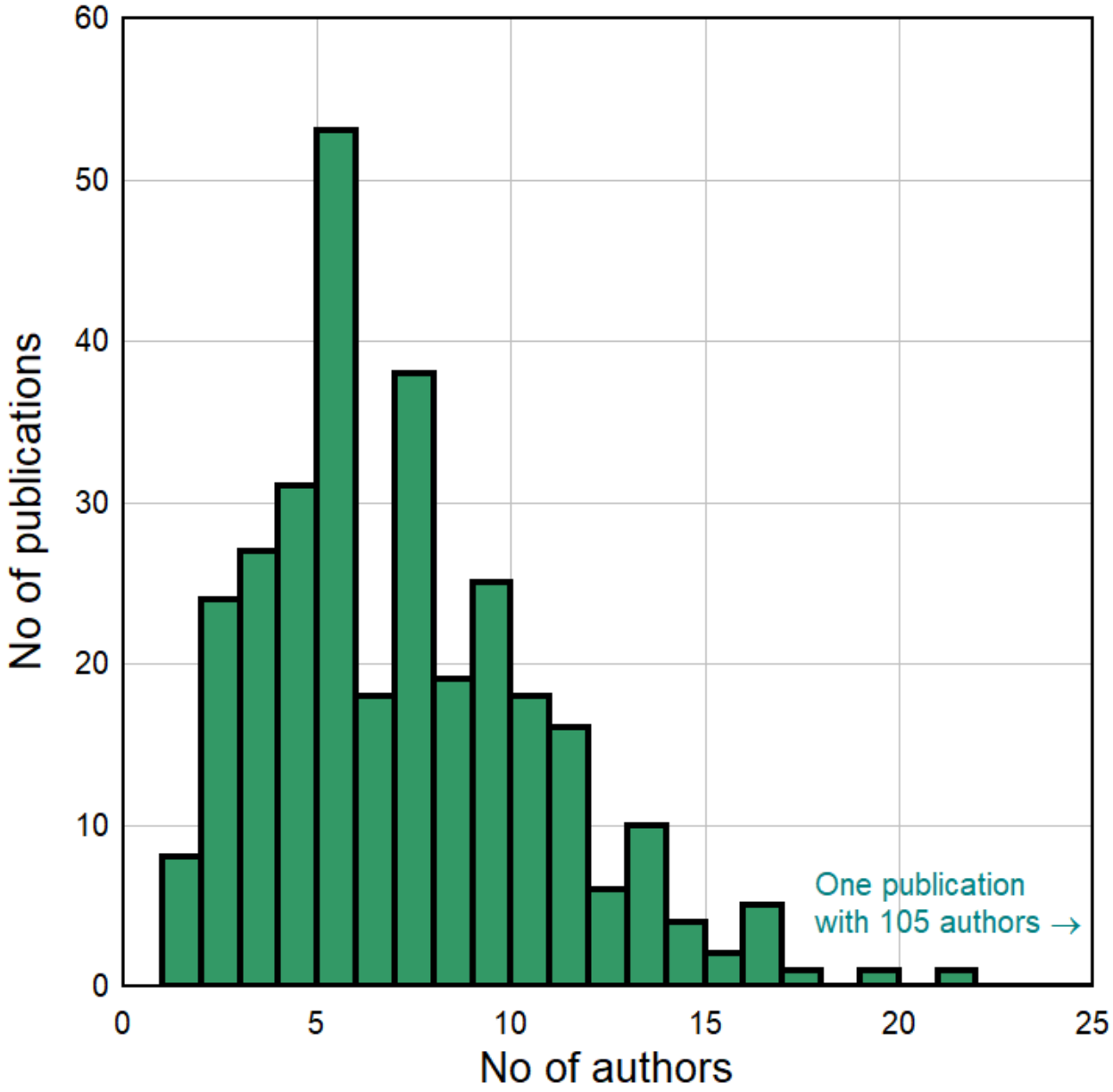
7. **Kaleta A. , Kret S. , Gas K. , Kurowska B. , Kryvyi S**. , Rutkowski B. , Szwacki N. , **Sawicki M. , Sadowski J**., *Enhanced Ferromagnetism in Cylindrically Confined MnAs Nanocrystals Embedded in Wurtzite GaAs Nanowire Shells*, Nano Letters **19**, 7324-7333 (2019) (IF = 12,279).

8. Korenev V. , Kalitukha I. , Akimov I.A. , Zhukov A. , Sapega V.F. , Kirstein E. , Ken O. , Kudlacik D. **, Karczewski G. ,** Wiater M. , **Wojtowicz T. ,** Ilyinskaya N. , Lebedeva N. , Komissarova T. , Kusrayev Y.G. , Yakovlev D.R. , Bayer M., *Low voltage control of exchange coupling in a ferromagnet-semiconductor quantum well hybrid structure*, Nature Communications **10**, 2899-1-8 (2019) (IF = 11,878).

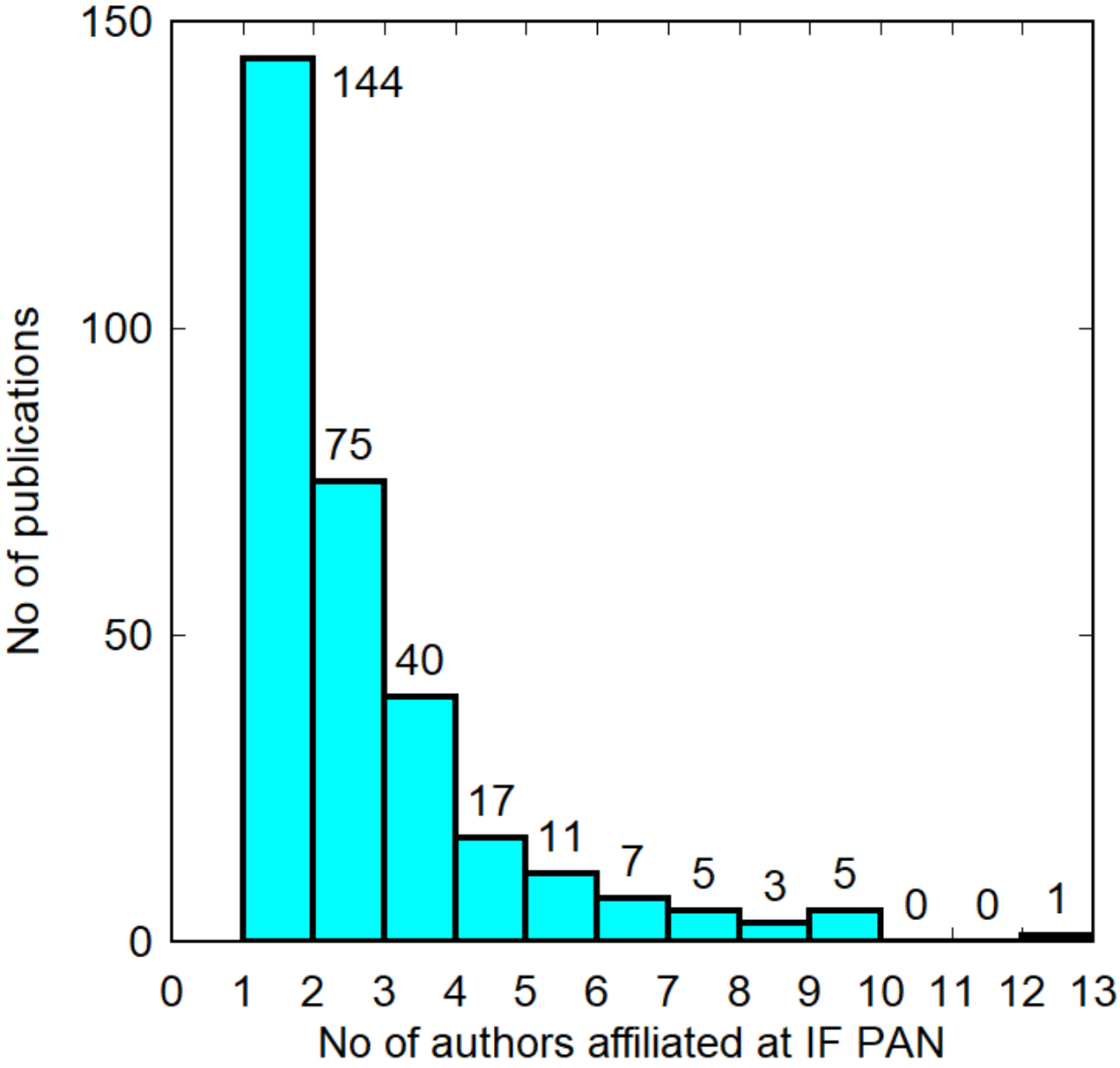
9. Niemczyk A. , Du Z. , Olszewska A. , Marzec M. , Gajewska M. , Świerczek K. , Zhao H. , Poudel B. , **Dąbrowski B**., *Effective oxygen reduction on A-site substituted LaCuO3-delta: toward air electrodes for SOFCs based on perovskite-type copper oxides*, Journal of Materials Chemistry A **7**, 27403 (2019) (IF = 10,733).

In 2018 – 10 papers with IF >10

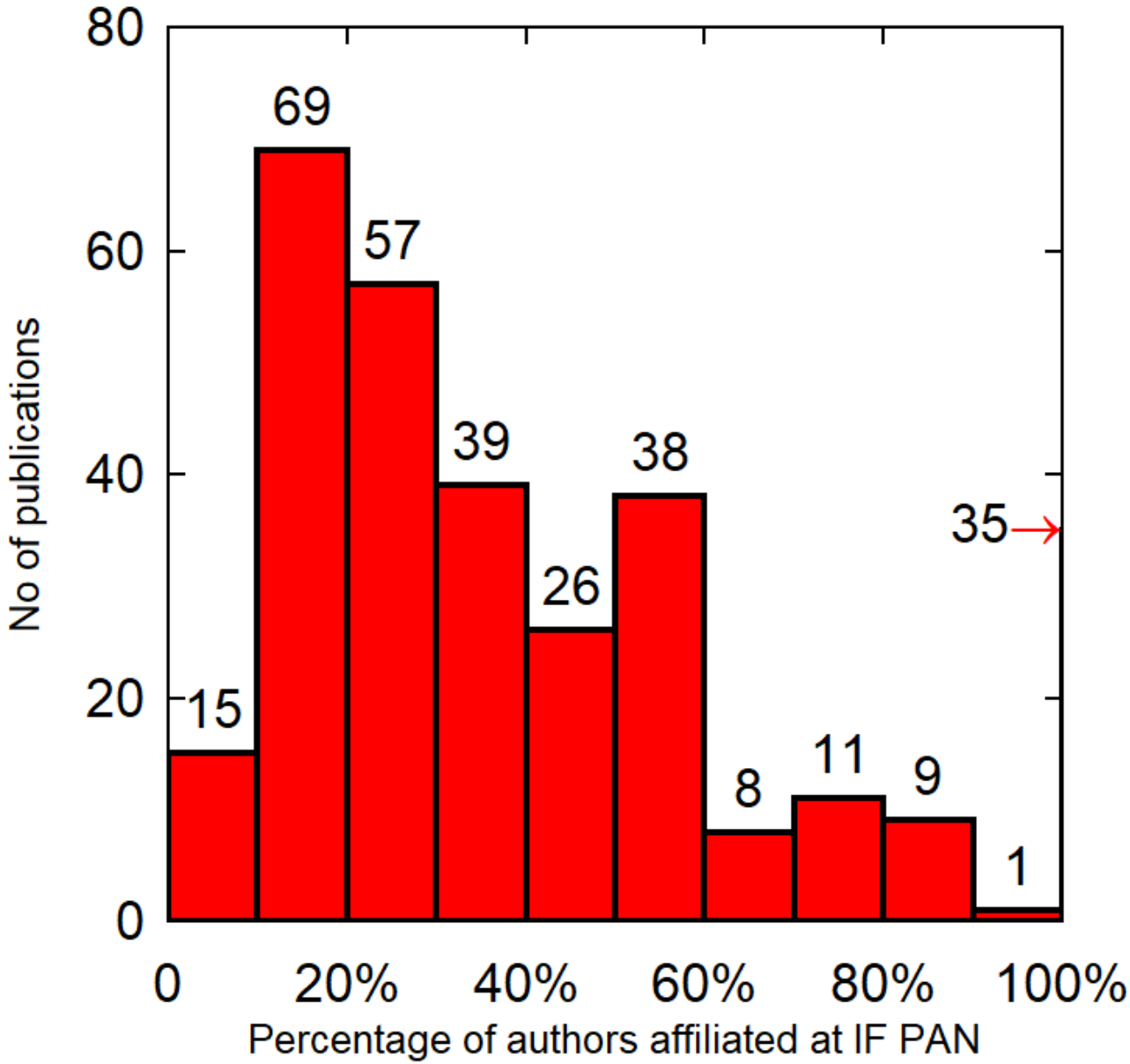
Publications in 2019



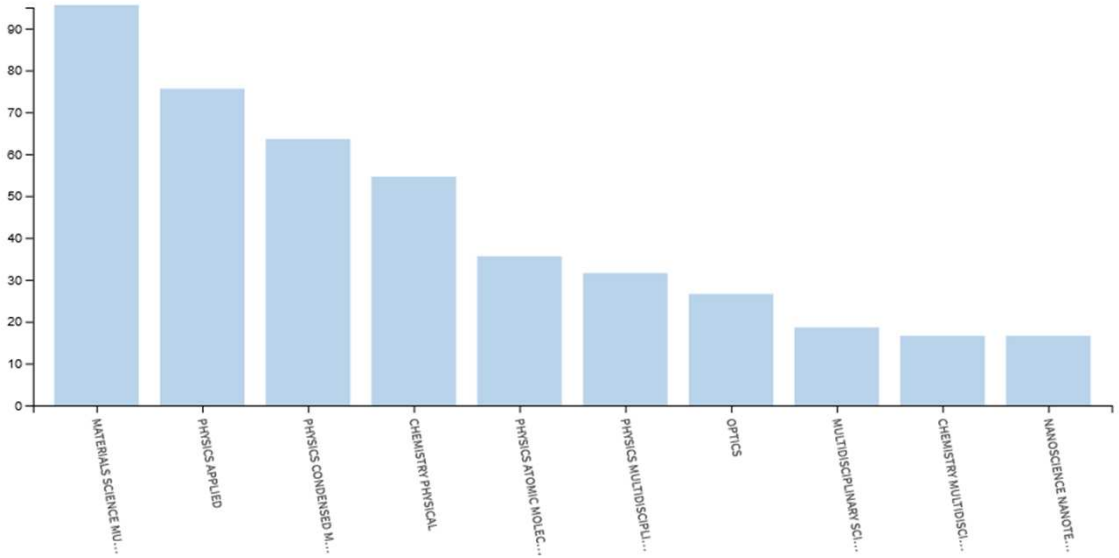
Publications in 2019



Publications in 2019



IF PAN publications in 2019: scientific categories



Web of Science Categories	records	% of 293
MATERIALS SCIENCE MULTIDISCIPLINARY	95	32.423
PHYSICS APPLIED	75	25.597
PHYSICS CONDENSED MATTER	63	21.502
CHEMISTRY PHYSICAL	54	18.430
PHYSICS ATOMIC MOLECULAR CHEM.	35	11.945
PHYSICS MULTIDISCIPLINARY	31	10.580
OPTICS	26	8.874
MULTIDISCIPLINARY SCIENCES	18	6.143
CHEMISTRY MULTIDISCIPLINARY	16	5.461
NANOSCIENCE NANOTECHNOLOGY	16	5.461
CRYSTALLOGRAPHY	13	4.437
METALLURGY METALLURGICAL ENG.	13	4.437
BIOCHEMISTRY MOLECULAR BIOLOGY	8	2.730
BIOPHYSICS	7	2.389
ENGINEERING ELECTRICAL ELECTRONIC	7	2.389
MATERIALS SCIENCE CERAMICS	7	2.389
MATERIALS SCIENCE COATINGS FILMS	6	2.048
CHEMISTRY APPLIED	5	1.706
CHEMISTRY INORGANIC NUCLEAR	4	1.365
PHYSICS FLUIDS PLASMAS	4	1.365
QUANTUM SCIENCE TECHNOLOGY	4	1.365
SPECTROSCOPY	4	1.365
COMPUTER SCIENCE INTERDISC. APPLIC.	3	1.024
ENGINEERING CHEMICAL	3	1.024
INSTRUMENTS INSTRUMENTATION	3	1.024

Source: Web of Science

Employees' statements: Branch / discipline

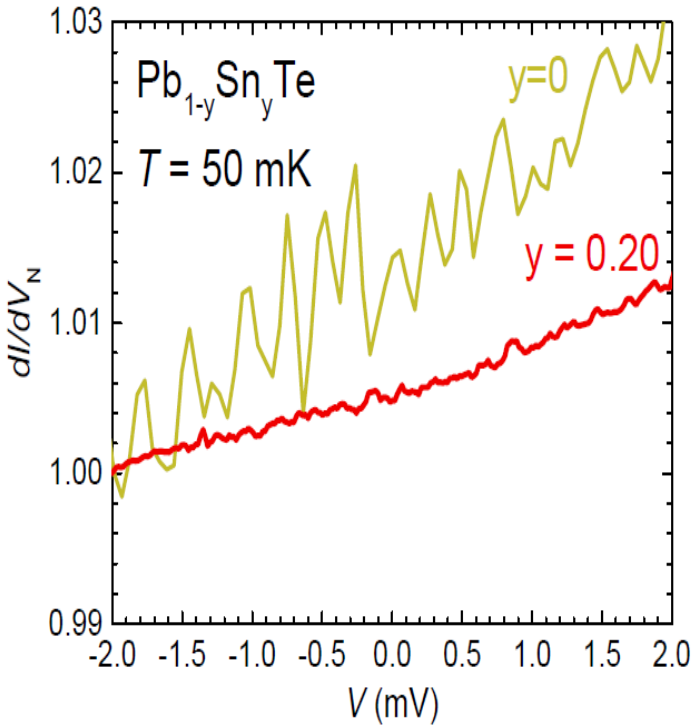
State for the day 31.12.2019

Single discipline (236 persons):	job positions
Science (pol. „nauki ścisłe i przyrodnicze")/**physics**:	218.0
Science/**chemistry**:	1.0

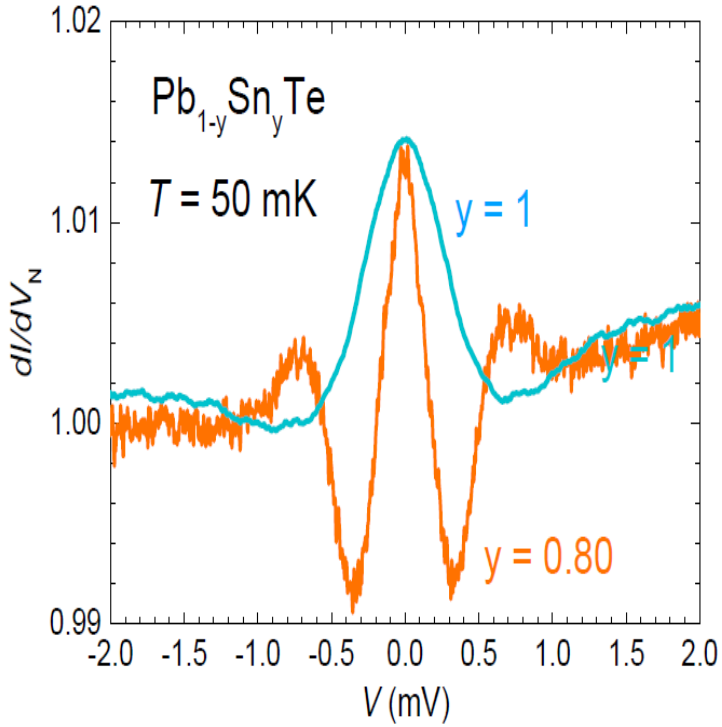
Two disciplines (34 persons):	job positions
Science/physics 75% / chemistry 25%	15.0
Science / physics 75% / biology 25%	6.5
Science /physics 75% **Engineering and technical studies** /material engineering 25% („nauki inżynieryjne i techniczne")	8.5
Science /physics 75% **Engineering and technical studies** /biomedical engineering 25%	1.0

G. Mazur, K. Dybko, A. Szczerbakow, J.Z. Domagała, A. Kazakov, M. Zgirski, E. Łusakowska, S. Kret, J. Korczak, T. Story, M. Sawicki, T. Dietl, "Experimental search for the origin of low-energy modes in topological materials",
Physical Review B (Condensed Matter), vol.100, 041408, 2019

Trivial insulator



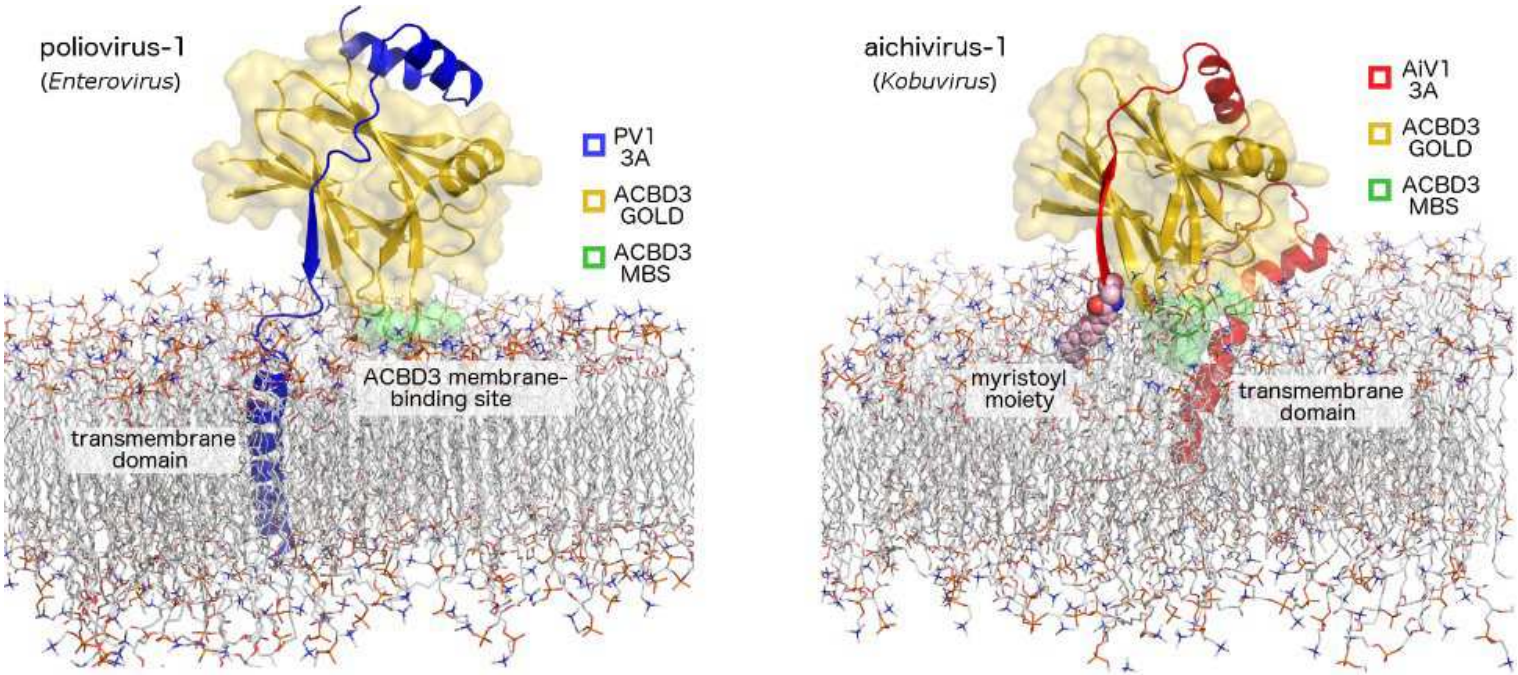
Topological insulator



Differential conductance spectroscopy

Dr hab. Bartosz Różycki SL4

Interactions of viral proteins with host-cell proteins on the sites of viral replication



PLOS Pathogens **15**, e1007962 (2019)

Publications in ON/SL

Scientific division	Number of publications with autor(s) from the division
ON-1	27
ON-2	53
ON-3	66
ON-4	56
ON-5	50
ON-6	36
SL-1	46
SL-2	15
SL-3	28
SL-4	13
Total **	390

- Employees who declared scientific discipline

** Note: some publications contain authors from more than one division.

Publications in ON/SL

Scientific division	Number of publications with autor(s) from the division	Summarized impact factor of the publications
ON-1	27	72,941
ON-2	53	172,771
ON-3	66	218,385
ON-4	56	181,229
ON-5	50	247,878
ON-6	36	115,541
SL-1	46	140,277
SL-2	15	51,278
SL-3	28	99,85
SL-4	13	44,646
Total **	390	1344,796

- Employees who declared scientific discipline

** Note: some publications contain authors from more than one division.

Publications in ON/SL

Scientific division	Number of publications with autor(s) from the division	Summarized impact factor of the publications	Σ(job positions)*
ON-1	27	72,941	28,7
ON-2	53	172,771	41,73
ON-3	66	218,385	33,22
ON-4	56	181,229	34,5
ON-5	50	247,878	24,75
ON-6	36	115,541	23
SL-1	46	140,277	26,49
SL-2	15	51,278	11,5
SL-3	28	99,85	11
SL-4	13	44,646	14,5
Total **	390	1344,796	249,39

- Employees who declared scientific discipline

** Note: some publications contain authors from more than one division.

Publications in ON/SL

Scientific division	Number of publications with autor(s) from the division	Summarized impact factor of the publications	Σ(job positions)*	Σ IF/(Σjob positions)
ON-1	27	72,941	28,7	2,54
ON-2	53	172,771	41,73	4,14
ON-3	66	218,385	33,22	6.57 (III)
ON-4	56	181,229	34,5	5.25
ON-5	50	247,878	24,75	10.02 (I)
ON-6	36	115,541	23	5.02
SL-1	46	140,277	26,49	5.30
SL-2	15	51,278	11,5	4.46
SL-3	28	99,85	11	9.08 (II)
SL-4	13	44,646	14,5	3.08
Total **	390	1344,796	249,39	

- Employees who declared scientific discipline

** Note: some publications contain authors from more than one division.

Publications: autorships of PhD students

Year of studies	No. of PhD students	No. of co-authorships
I	3	0
II	16	8
III	9	11
IV	13	17
V	13	26
VI	3	5

Patents

obtained in 2019:

1. Patent PL nr **232163** wg zgłoszenia P.426579 z dnia 2016.03.21 pt.” **Magnetron do osadzania cienkich warstw stopów metali z galem**”(Magnetron for thin layer deposition of metal alloys with gallium)- twórcy: Michał Chojnacki, Krzysztof Fronc, Henryk Szymczak (decyzja z dnia 10.01.2019).

2. Patent PL nr **232257** wg zgłoszenia P**.421937** z dnia 19.06.2017 pt.”**Sposób otrzymywania porowatej warstwy półprzewodnika ferromagnetycznego”** (Method of obtaining porous layer of ferromagnetic semiconductor) **-** twórcy**:** Jarosław Kaszewski, Rafał Pietruszka, Marek Godlewski (decyzja z dnia 22.01.2019).

3. Patent PL nr **232774** wg zgłoszenia P**.413924** z dnia 11.09.2015 pt.”**Sposób domieszkowania tlenku cynku (ZnO) jonami pierwiastków ziem rzadkich (RE)”** (Method of doping ZnO with rare earth ions) – twórcy:Andrzej Torus,Renata Ratajczak, AnnaStonert, Elżbieta Guziewicz, Krzysztof Kopalko, Marcin Stachowicz. (decyzja z dnia 22.03.2019). Patent wspólny IF PAN, ITME oraz Naukowe Centrum Badań Jądrowych.

4. Patent PL nr według zgłoszenia P423464 z dnia 14.11.2017 pt.” **Struktura dwukolorowej diody elektroluminescencyjnej oraz sposób wykonania struktury dwukolorowej diody elektroluminescencyjnej”** (Structure of two-colour electroluminescent diode and method of obtaining the diode) - twórcy: Adrian Kozanecki, Ewa Przeździecka (decyzja z dn.3.06.2019).

5. Patent PL nr według zgłoszenia P416251 z dnia 24.02.2016 pt. „**Sposób otrzymywania kryształu tlenku cynku z fazy gazowej**” (Method of obtaining ZnO crystals from gaseous phase) – twórcy: Paweł Skupiński, Krzysztof Grasza, Andrei Avdonin (decyzja o udzieleniu 24.06.2019).

6. Patent PL nr według zgłoszenia P416557 z dnia 21.03.2016 pt. „**Sposób wytwarzania cienkich warstw stopów metali z galem metodą rozpylania magnetronowego otrzymywania”** (Method of obtaining thin layers of metal alloys with gallium by magnetron sputtering) , twórcy: Michał Chojnacki, Krzysztof Fronc, Henryk Szymczak (decyzja o udzieleniu 13.09.2019).

7. Patent PL nr według zgłoszenia P416263 z dnia 25.02.2016 pt. **„Złącze elektryczne na bazie tlenku cynku oraz sposób wykonania tego złącza”** (Electric junction of ZnO and method of obtaining the junction) - Elżbieta Guziewicz, Mieczysław Pietrzyk, Ewa Przeździecka, Dymitr Snigurenko (decyzja o udzieleniu 19.09.2019).

+ 6 applications submitted in 2019

Scientific employees

position	Number of persons
Professor Member of Academy	4 (4)
Professor	44 (42)
Associate professor	37 (27)
Post-doc (adiunkt)	59 (58)
Assistant	24 (13)
Research-technical	43 (48)
TOGETHER	211 (192)
Engineering-technical	92 (94)

Number of employees who declared research discipline	269

Grey numbers indicate analogical values for 2018

Promotions

Type of promotion	result
Obtained professor titles	0 (1)
Obtained degrees of „doktor habilitowany”	6 (3)
Obtained degrees of doctor	7* (10)
Number of PhD students (MSD, 31.12.2019)**	81 (94) 57 (IF PAN)***
New PhD students accepted for 1st year of the Doctoral School „Warsaw-4-PhD”, at IF PAN	11

* 1 of emploees obtained PhD in chemistry, in other institute
** closed studies
*** Remaining PhD students: 8 CFT PAN, 14 IWC PAN, 1 ITE, 1 Uniw. Rzeszów

Grey numbers indicate analogical values for year 2018

Scientific projects

type	number
Projects realized in 2019 (started, continued or finished)	93 (100)
Projects started in 2019	20 (23)
Projects finished in 2019	23 (39)
Stipends as projects	3 (4)
Employees hired from projects	46 (31)

Grey numbers indicate analogical values for year 2018

Scientific projects

Types of scientific projects:

Projekty badawcze OPUS	33
Projekty badawcze PRELUDIUM	10
Projekty badawcze SONATA	4
Projekty badawcze SONATA BIS	9
Projekty badawcze HARMONIA	1
Projekty badawcze MAESTRO	2
Projekty badawcze FUGA	1
Projekty badawcze POLONEZ	1
Projekty badawcze SHENG	1
Projekty badawcze SONATINA	1
Projekty badawcze QuantERA	4
Projekty badawcze ETIUDA	2
Projekty badawcze JPND	1
Projekty badawcze MINIATURA	3
Projekty badawczo-rozwojowe NCBiR	5
Projekty badawcze FNP	4
Projekty badawcze KE	2
Projekty badawcze MNiSW	3
Stypendia MNiSW	3
Pozostałe	3

PhD school „Warsaw-4-PhD”

The PhD school is a collaboration between 9 research institutes in 4 scientific disciplines: biology, chemistry, physics, and medicine:

1. Nencki Institute of Experimental Biology of the Polish Academy of Sciences
2. Institute of Organic Chemistry of the Polish Academy of Sciences
3. Institute of Physical Chemistry of the Polish Academy of Sciences
4. **Institute of Physics of the Polish Academy of Sciences**
5. Center for Theoretical Physics of the Polish Academy of Sciences
6. Institute of High Pressure Physics of the Polish Academy of Sciences
7. Maria Skłodowska-Curie Institute - Oncology Center
8. Institute of Psychiatry and Neurology
9. International Institute of Molecular and Cell Biology in Warsaw

Warsaw-4-PhD
Warszawska Szkoła Doktorska Nauk Ścisłych i BioMedycznych

The agreement was signed on 02 April 2019

Head of the Physics Specialization
Dr. hab. Piotr Deuar

Actually, **11** PhD students accepted for the projects offered by IF PAN.

Popularization of physics



- **Physics Experiments for Kids (Thursdays, hall A) – dr Beata Brodowska** et al..
- Experimental workshops for talented youngs (Jan. 2019) – dr Krzysztof Dybko et al..
- Scientific Picnic (11 May 2019, National Stadium, Warsaw) – dr hab. Izabela Kuryliszyn-Kudelska et al..
- Warsaw Science Festival (September 2019) – dr Adam Zakrzewski et al..
- Popularization lectures, lessons and experimental shows (Prof. M. Godlewski, dr M. Foltyn, dr Izabela Kamińska, dr M. Aleszkiewicz, dr M. Galicka, dr. M. Szot, dr T. Wojciechowski, dr R. Jakieła, dr hab. P. Wojnar, Ms A. Drzazga, and others)
- Young Physicists Tournament – dr Leszek Gładczuk et al..
- Tournament „Fizyczne Ścieżki" – prof. Andrzej Wiśniewski, et al..
- Contribution to organization of the Physics Olympiad, prof. J. Mostowski

REPORTING SESSION

Institute of Physics
Polish Academy of Sciences
Research Activity in 2019
SUMMARY

SESJA SPRAWOZDAWCZA

*Działalność Naukowa Instytutu Fizyki PAN w roku **2019** Podsumowanie*