

# ANNUAL REPORT

2016

Edited by: NCN Communications Team

**National Science Centre**

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**BASIC RESEARCH  
IS THE ESSENCE  
OF ALL SCIENCE**



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## ABOUT THE NCN



# BASIC

## INFORMATIONS

### MISSION

SUPPORTING THE DEVELOPMENT OF POLISH RESEARCH ON THE INTERNATIONAL ARENA AND LEVERAGING THE QUALITY AND EFFECTIVENESS OF RESEARCH THROUGH A COMPETITIVE GRANT SYSTEM.

### GOALS

- Funding excellent research projects in basic research.
- Supporting researchers starting their career in research.
- Inspiring the creation of large, interdisciplinary research teams which are able to compete internationally.
- Fostering international cooperation in research.
- Creating new job opportunities in NCN-funded projects.

### ABOUT NCN

The National Science Centre (Narodowe Centrum Nauki, NCN) is a government executive agency set up to fund basic research. Basic research is original experimental or theoretical research work that strives to expand knowledge of the fundamentals of phenomena and observable facts. It is not intended to have any direct commercial application or use.

The NCN announces calls for research projects, pre-doctoral scholarships and post-doctoral internships on a regular basis. The funding programmes are open to all researchers at all stages of their research career.

The high quality of funded projects is ensured by a two-step peer review assessment procedure, which takes into account not only the scientific excellence of the research project, but also the research portfolio of the applicant. The NCN also supports and monitors the progress of research projects financed under its funding opportunities through review and examination of annual and final reports, as well as on-site visits to selected host institutions.

The Centre also inspires international cooperation, monitors funding granted for basic research outside of the state budget and disseminates information about its funding opportunities in research communities.

# HIGH LIGHTS

2016

4

MARCH

NCN's 5th anniversary

11-12

MAY

NCN Open Days  
in Olsztyn

18

MAY

the NCN announces the  
results of the first edition  
of POLONEZ call for propo-  
sals targeted at incoming  
researchers wanting to do  
research in Poland

15

SEPTEMBER

launch of the second edition  
of the BEETHOVEN call for  
Polish-German research  
projects, launched together  
with the German Research  
Foundation (Deutsche For-  
schungsgemeinschaft, DFG)

12

OCTOBER

the NCN Award 2016 was  
granted to Dr hab. Marcin  
Szwed (HS), Dr hab. Katarzyna  
Starowicz-Bubak (NZ) and  
Prof. Mikołaj Bojańczyk (ST)

16

NOVEMBER

Memorandum of Under-  
standing signed between  
the NCN and Lithuanian  
Research Council (Lietu-  
vos mokslo taryba, LMT)

1

NOVEMBER

launch of the QuantERA programme  
supporting research in Quantum  
Technologies, coordinated by the  
NCN, co-funded by the European  
Commission within Horizon 2020

1-2

DECEMBER

QuantERA kick-off meeting  
takes place in Lisbon

14-15

DECEMBER

new members of NCN Council  
appointed, election of the new  
chair Prof. Janusz Janeczek

15

DECEMBER

NCN launches its new  
funding opportunities:  
SONATINA 1, UWERTURA 1,  
MINIATURA 1 and imple-  
ments a new electronic-only  
submission process




# STRUC TURE



## NCN DIRECTOR

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The Director of the National Science Centre, selected within the competition by the NCN Council and appointed by the Minister of Science and Higher Education, is responsible for financial management as well as the correct and efficient completion of NCN tasks. The director is also in charge of international cooperation and acts as a legal representative on behalf of the Centre.

## NCN COUNCIL

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The NCN Council is a policy body consisting of 24 distinguished researchers representing different academic fields. The Council sets priority areas in basic research, decides on the type of programmes and specifies call regulations. Its range of competencies also includes electing members of the expert teams responsible for proposal evaluations.

## NCN COUNCIL IN 2016

### Term of office: 2014-2016

Prof. Michał Karoński – Chair  
Arts, Humanities and Social Sciences (HS)

Prof. Maciej Grochowski

**Prof. Janina Józwiak, died 19 July 2016**  
(chair of HS Committee)

Prof. Ireneusz Kamiński

Prof. Małgorzata Kossowska

Prof. Teresa Malecka

Rev. Prof. Dr hab. Andrzej Szostek

Prof. Wojciech Tygielski

### Physical Sciences and Engineering (ST)

Prof. Zbigniew Błocki (until 3rd March 2015)

Prof. Elżbieta Frąckowiak

Prof. Janusz Janeczek

Prof. Ryszard Kierzek (until 11th June 2015)

**Prof. Henryk Kozłowski (chair of ST Committee)**

Prof. Ewa Łokas

Prof. Michał Malinowski

Prof. Andrzej Sobolewski

Prof. Jacek Tejchman-Konarzowski

Prof. Marek Żukowski

### Life Sciences (NZ)

Prof. Jerzy Chudek

Prof. Artur Jarmołowski

Prof. Krzysztof Józwiak

Prof. Sergiusz Józwiak

**Prof. Leszek Kaczmarek (chair of NZ Committee)**

Prof. Jan Kotwica

Prof. Krzysztof Nowak

Prof. Maciej Wołowicz

### Term of office: 2016-2018

Prof. Janusz Janeczek – Chair

Arts, Humanities and Social Sciences (HS)

Prof. Krystyna Bartol

**Prof. Małgorzata Kossowska (chair of HS Committee)**

Prof. Teresa Malecka

Dr hab. Oktawian Nawrot

Rev. Prof. Andrzej Szostek

Prof. Jan Jacek Sztudynger

Prof. Wojciech Tygielski

### Physical Sciences and Engineering (ST)

Prof. Mikołaj Bojańczyk

Prof. Grzegorz Karch

Prof. Wojciech Kuczewicz

Prof. Stanisław Lasocki

**Prof. Ewa Łokas (chair of ST Committee)**

Prof. Ewa Majchrzak

Prof. Ewa Mijowska

Prof. Andrzej Sobolewski

Prof. Marek Żukowski

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Prof. Jerzy Chudek

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Prof. Krzysztof Józwiak

Prof. Jan Kotwica

Prof. Marta Międzyńska

**Prof. Krzysztof Nowak (chair of NZ Committee)**

Prof. Anetta Undas

## NCN OFFICE

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The NCN Office is an entity combining the efforts of a number of the NCN's departments and teams. On a day-to-day basis, the Office is responsible for processing calls for proposals and organising meetings for experts at the peer review evaluation stage. The Office also provides support to the applicants and answers their queries. Its major responsibilities also include administrative and financial management of grant agreements, fostering international cooperation and disseminating of information about NCN funding opportunities among researchers.

## NCN COORDINATORS

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The NCN Coordinators are scientific officers responsible for organising and conducting calls for proposals for research projects. Their responsibilities also include evaluation of the impartiality of the peer review process, the eligibility check of proposals submitted within the calls, as well as the promotion of NCN funding programmes in the research community. Coordinators support the NCN Council in developing the research policy.

Coordinators work within the NCN in three units: Arts, Humanities and Social Sciences; Life Sciences; and Physical Sciences and Engineering. They are selected by the NCN Council on the basis of

competition. Candidates for this position must have at least a PhD.

## NCN STRUCTURE

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In 2016 the NCN introduced changes to its organisation structure. In April a Help-desk for applicants was created. Among its duties were: providing applicants with information about calls for proposals and the submission system as well as preparing call documentation in cooperation with NCN Coordinators and the Office of the NCN Council.

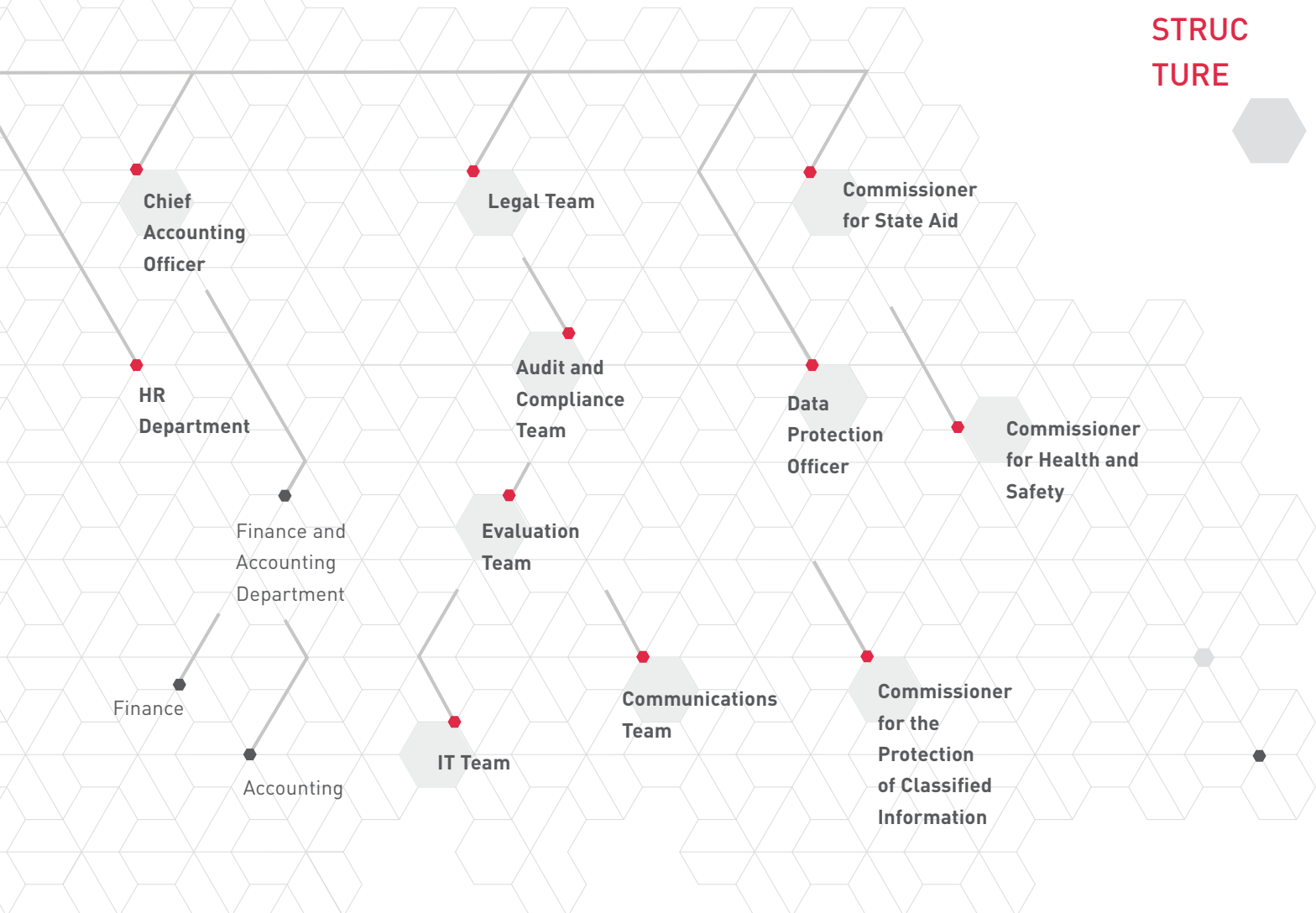
Taking into consideration the increase in proposals submitted to the NCN every year as well as the broadening of the NCN funding portfolio, a new department, whose role is to handle applications put forward to the NCN and support the organisation of peer review panels, was created. In December 2016 the Help-desk was replaced by the Application Processing Department.

## STRUC TURE

## STRUC TURE



## STRUC TURE

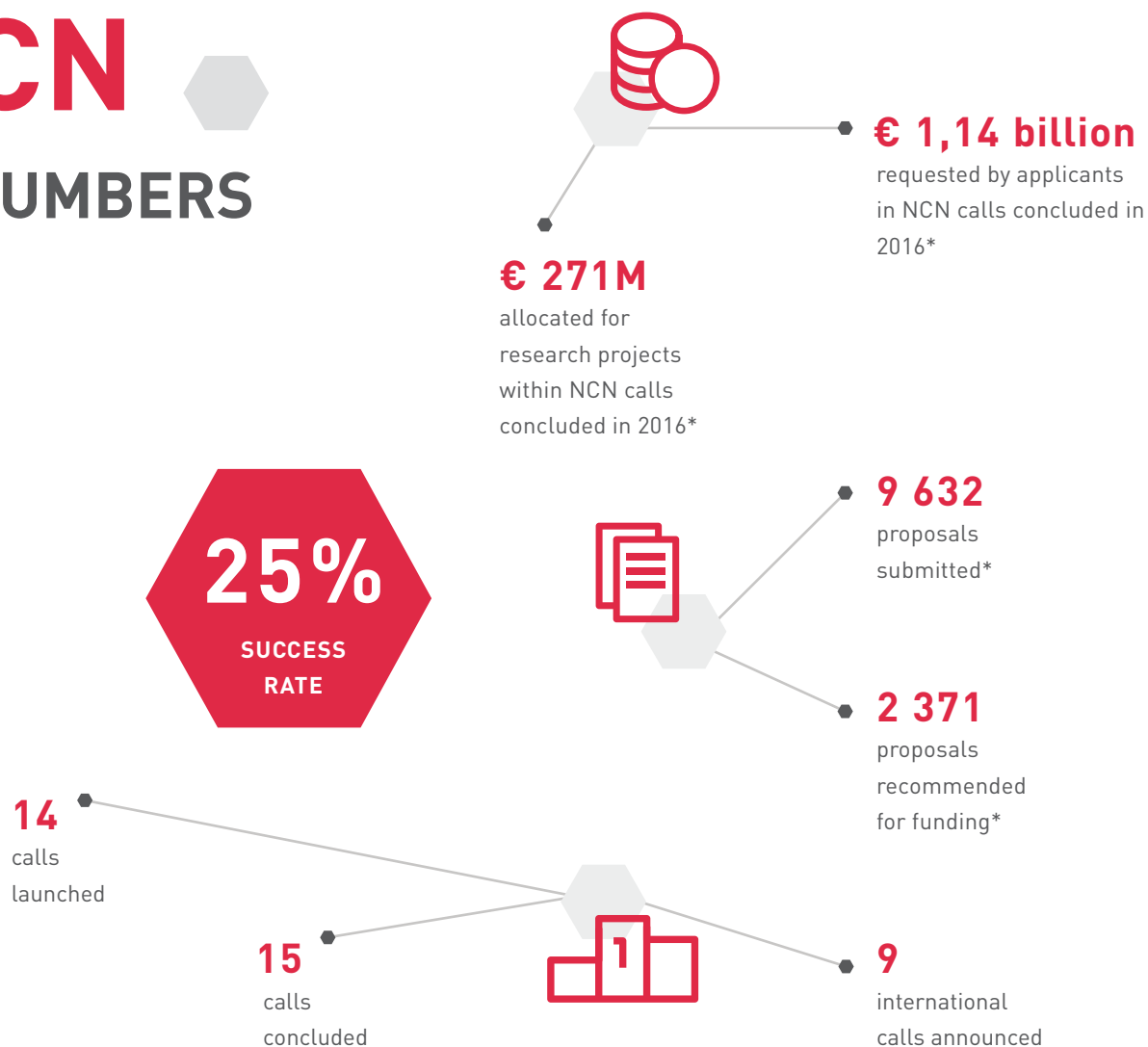


# EXECUTION OF NCN TASKS IN 2016



# NCN

## IN NUMBERS



\* The data does not take into account the TANGO call for proposals launched by the NCN together with the National Centre for Research and Development (NCBR). Within this call funding is granted by the NCBR.

# FUNDING SCHEMES

**The National Science Centre funds basic research in the form of research projects, doctoral scholarships and post-doctoral internships.**

Calls for proposals are announced 4 times a year and researchers have 3 months for the submission of proposals, with the exception of MINIATURA call which is launched once a year as an open call. NCN funding schemes take into account the various needs of the research community, including researchers starting their career, as well as advanced researchers.

In 2016 the NCN suspended FUGA and SYMFONIA funding schemes. However, new programmes were introduced: SONATINA for researchers at the onset of their career, a continuation of Iuventus Plus funding scheme taken over from the Ministry of Science and Higher Education, UWERTURA - a funding

opportunity offering researchers fellowships in European Research Council-funded projects and MINIATURA - a scheme offering funding for single activities that serve as part of larger basic research.

In addition, the Centre announces calls for proposals in cooperation with international partners. In 2016 the NCN launched 11 funding schemes targeted at researchers who intend to carry out research projects together with their international peers. More information about international funding schemes can be found in the "International Cooperation" section.

The NCN accepts proposals in all research disciplines included in the NCN panels.



## PRELUDIUM

### CALL FOR RESEARCH PROJECTS



**Applicants:** pre-doctoral researchers



**Duration:** 12, 24 or 36 months



**Funding:** ca. EUR 14 000, 29 000 or 43 000 depending on the project's duration



**Other requirements:** research project must be supervised by the Principal Investigator's supervisor



**Call for proposals:** twice a year

## MAESTRO

### A FUNDING OPPORTUNITY FOR ADVANCED RESEARCHERS

wanting to conduct pioneering research, including interdisciplinary research, which is important for the development of science, surpasses the current state of knowledge, and may result in scientific discoveries



**Applicants:** advanced researchers who in a 10-year period have published at least 5 publications in renowned journals, have led at least two completed research projects selected within national or international calls for proposals



**Duration:** 36, 48 or 60 months



**Funding:** no cap on funding for an individual project



**Other requirements:** at least one investigator with a doctorate and at least one doctoral candidate must be employed in the project



**Call for proposals:** once a year

## MINIATURA

### A SCHEME OFFERING FUNDING FOR SINGLE ACTIVITIES THAT SERVE AS PART OF LARGER BASIC RESEARCH



**Applicants:** researchers with a doctoral degree obtained within the last 12 years prior to the submission of the proposal, who have not been NCN-grantees



**Duration:** up to 12 months



**Funding:** from EUR 1 200 – 12 000



**Call for proposals:** on-going, 1-stage merit-based evaluation by peer reviewers

## ETIUDA

### CALL FOR DOCTORAL SCHOLARSHIPS



**Applicants:** PhD candidates working on their PhD thesis



**Duration:** 6-12 months and a research stay of 3-6 months at a research centre outside of Poland



**Funding:** ca. EUR 1 000 monthly and resources to cover the costs of travel and a research stay at a research centre outside of Poland



**Other requirements:** the recipient of the scholarship must obtain his or her doctoral degree within 6-12 months of the scholarship paying period



**Call for proposals:** once a year

## FUNDING SCHEMES

## SONATA

### CALL FOR RESEARCH PROJECTS

involving innovative basic research, using advanced research equipment and/or an original methodology



**Applicants:** researchers with a doctoral degree obtained within 2-7 years prior to the submission of the proposal



**Duration:** 12, 24 or 36 months



**Funding:** no cap on funding for an individual project



**Call for proposals:** once a year

## SONATA BIS

### CALL FOR RESEARCH PROJECTS

that include establishing new research teams



**Applicants:** researchers with a doctoral degree obtained within 5-12 years prior to the submission of the proposal



**Duration:** 36, 48 or 60 months



**Funding:** no cap on funding for an individual project



**Call for proposals:** once a year

## OPUS

### A FUNDING OPPORTUNITY INTENDED FOR A WIDE RANGE OF APPLICANTS

the research proposal submitted under this scheme may include the purchase or construction of research equipment



**Applicants:** all researchers irrespective of their research experience



**Duration:** 12, 24 or 36 months



**Funding:** no cap on funding for an individual project



**Call for proposals:** twice a year

## SONATINA

### CALL FOR RESEARCH PROJECTS

offering full-time employment in Polish research institutions and a 3 to 6-month visiting fellowship outside of Poland



**Applicants:** researchers within 3 years of receiving their PhD degree or those who will obtain a PhD degree on the 30th of June of the year referred to in the call documentation



**Duration:** 24 or 36 months



**Funding:** no cap on funding for an individual project, max. EUR 24 000 to cover the employment costs of the Principal Investigator, EUR 2 100 a month to cover the costs of travel and a research stay outside of Poland



**Call for proposals:** once a year

## HARMONIA

### A FUNDING OPPORTUNITY

addressed to researchers who want to carry out research projects in international cooperation, not co-financed from International sources



**Applicants:** all researchers, irrespective of their research experience



**Duration:** 12, 24 or 36 months



**Funding:** from EUR 119 000–357 000 depending on the project's duration (only for the Polish research team)



**Call for proposals:** once a year

## POLONEZ

### A FUNDING PROGRAMME

addressed to incoming researchers who want to carry out research in host institutions in Poland



**Applicants:** researcher with a PhD degree or at least four years of full-time equivalent research experience who has not resided or carried out their main activity (work, studies, etc.) in Poland for more than 12 months in the 3 years immediately prior to the call announcement



**Duration:** 12 or 24 months

## UWERTURA

### A FUNDING OPPORTUNITY

offering researchers fellowships in european research council-funded projects



**Applicants:** doctoral researchers who have carried out or are carrying out, as Principal Investigators, research projects funded by the NCN, and are not European Research Council (ERC) grantees



**Fellowship duration:** 3-6 months



**Funding:** EUR 3 500 a month + travel costs



**Other requirements:** Applicants are required to put forward a project description to be submitted under the ERC call for proposals within 18 months from the fellowship completion



**Call for proposals:** once a year

## TANGO

### A FUNDING SCHEME

that enables researchers to turn their projects in basic research into solutions and products that may benefit society in a direct way



**Applicants:** researchers who have acted as Principal Investigators, investigators or supervisors in projects in basic research



**Duration:** the concept phase: 3-12 months, the research and development (R&D) phase: up to 24 months



**Funding:** concept phase: up to ca. EUR 36 000, R&D phase: up to EUR 238 000



**Call for proposals:** once every two years, launched by the NCN together with the National Centre for Research and Development (NCBR)

## FUNDING SCHEMES

# PANELS



## ARTS, HUMANITIES AND SOCIAL SCIENCES —

- HS** **HS1** Fundamental questions of human existence and the nature of reality
- HS2** Cultures and cultural creativity
- HS3** The study of the human past
- HS4** Individuals, institutions and markets
- HS5** Social norms and governance
- HS6** Human nature and human society



## PHYSICAL SCIENCES AND ENGINEERING —

- ST** **ST1** Mathematics
- ST2** Fundamental constituents of matter
- ST3** Condensed matter physics
- ST4** Physical and Analytical Chemical sciences
- ST5** Materials and Synthesis
- ST6** Computer science and informatics
- ST7** Systems and telecommunications engineering

**ST8** Products and processes engineering

**ST9** Astronomy and space research

**ST10** Earth system science



## LIFE SCIENCES —

- NZ** **NZ1** Molecular and Structural Biology and Biochemistry
- NZ2** Genetics, Genomics
- NZ3** Cellular and Developmental Biology
- NZ4** Biology of Tissues, Organs and Organisms
- NZ5** Human and Animal non-infectious diseases
- NZ6** Human and Animal immunology and infection
- NZ7** Public health
- NZ8** Evolutionary and environmental biology
- NZ9** Applied life sciences and biotechnology

# FUNDING

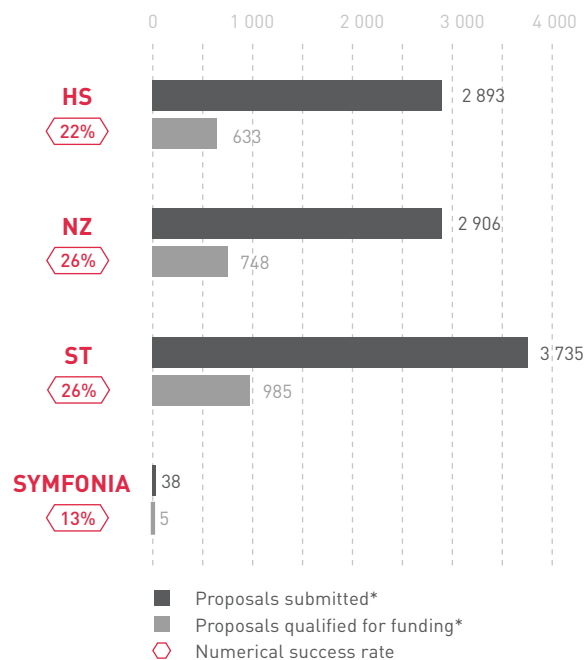
## OF RESEARCH PROJECTS

In calls for proposals launched in 2016, 9632 applications for a total over EUR 1,14 billion were submitted. 2371 applications worth over EUR 271 million\* were qualified for funding.

**Number of proposals submitted and qualified for funding within calls concluded in 2016 with breakdown into research domains, along with the numerical success rate\*\***

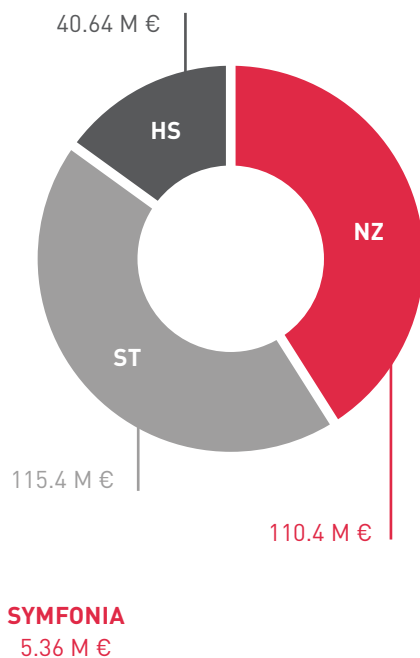
\* This table does not include the TANGO funding scheme.

\*\* The success rate is the percentage of applications that have received funding. It shows the ratio of proposals selected for funding to the proposals submitted.



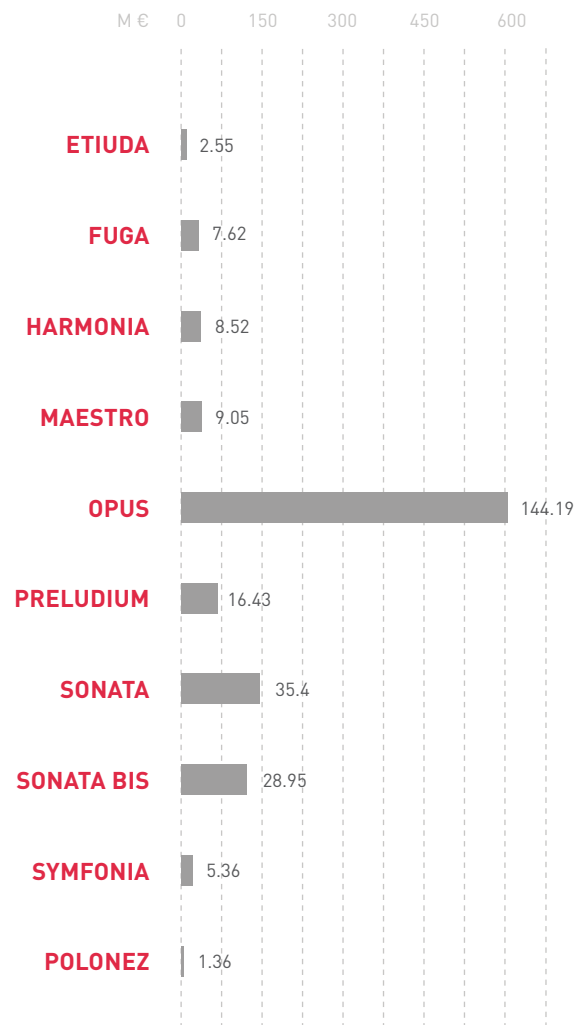
## FUNDING OF RE SEARCH PRO JECTS

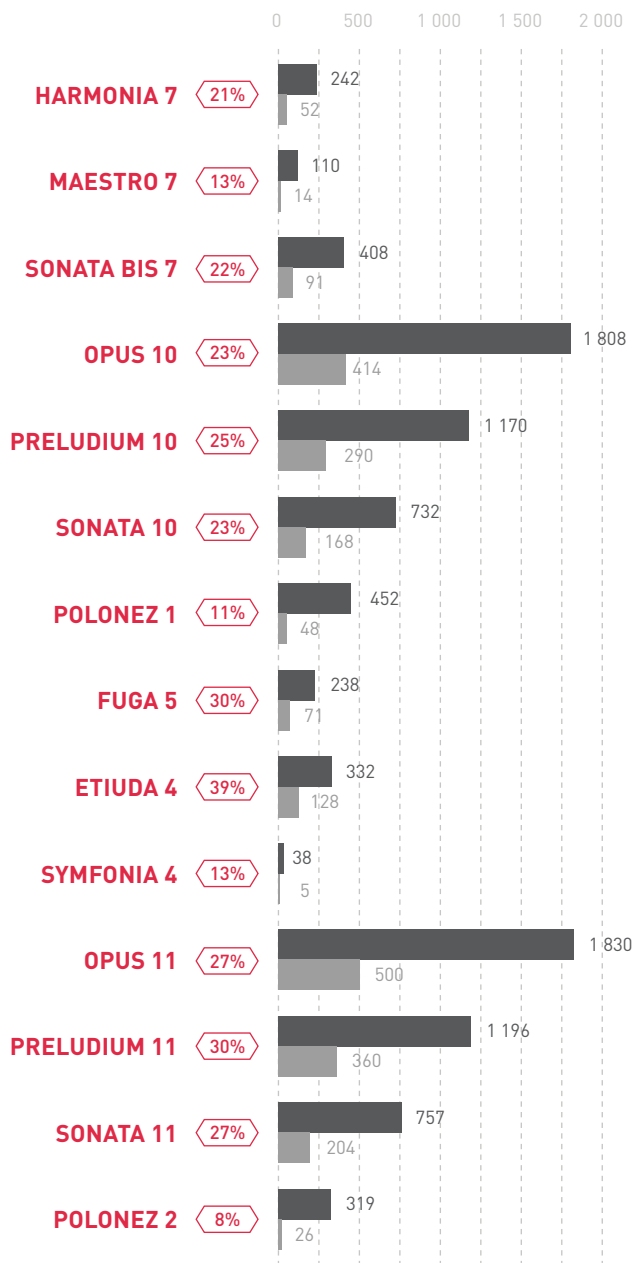
Funding granted in 2016 with breakdown into research domains\*.



\*This data does not include the TANGO funding scheme.

Funding granted within calls concluded in 2016 with breakdown into types of funding schemes.





#### TOTAL:

25%

9 632 submitted proposals

2 371 proposals qualified for funding

- Proposals submitted\*
- Proposals qualified for funding\*
- ⬡ Numerical success rate

## FUNDING OF RE SEARCH PRO JECTS

**Number of applications submitted and selected for funding in calls for proposals concluded in 2016\* with breakdown into funding schemes, along with the numerical success rate\*\***

\* The data does not take into account TANGO call for proposals launched by the NCN together with National Centre for Research and Development (NCBR). Within this call funding is granted by the NCBR.

\*\* The numerical success rate is the percentage of applications that have received funding. It shows the ratio of proposals selected for funding to the proposals submitted.

## BEST PERFORMING POLISH HOST INSTITUTIONS IN 2016

A ranking of the highest NCN beneficiaries in 2016 included:

- public and private universities (73% of all beneficiaries),
- Polish Academy of Sciences (PAN) research institutions (20%),
- research institutes (3%).

HOST INSTITUTION	Funding granted in M €	Proposals qualified for funding	Numerical success rate
University of Warsaw	26.06	275	39%
Jagiellonian University	25.98	236	38%
Adam Mickiewicz University in Poznań	11.84	119	30%
University of Wrocław	10.06	90	34%
AGH university of Science and Technology	8.53	74	30%
Wrocław University of Technology	7.01	65	31%
University of Gdańsk	6.85	57	27%
Nicolaus Copernicus University in Toruń	6.46	60	28%
Nencki Institute of Experimental Biology, Polish Academy of Sciences	6.15	41	47%
Warsaw University of Technology	4.65	55	21%
Lodz University of Technology	4.36	29	24%
University of Łódź	3.95	55	24%
Medical University of Warsaw	3.86	21	20%
International Institute of Molecular and Cell Biology in Warsaw	3.68	14	88%



Jagiellonian University Medical College	3.47	23	37%
Medical University of Łódź	3.39	27	24%
Silesian University of Technology	3.32	35	19%
Poznań University of Medical Sciences	3.3	22	22%
Institute of Bioorganic Chemistry, Polish Academy of Sciences	3.04	17	45%
University of Silesia in Katowice	3.01	31	20%
Institute of Biochemistry and Biophysics, Polish Academy of Sciences	2.97	18	39%
Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences	2.9	13	41%
Medical University of Gdańsk	2.82	20	24%
University of Warmia and Mazury in Olsztyn	2.72	31	16%
Poznań University of Life Sciences	2.65	18	20%
Institute of Pharmacology, Polish Academy of Sciences	2.63	17	52%

## FUNDING OF RE SEARCH PRO JECTS

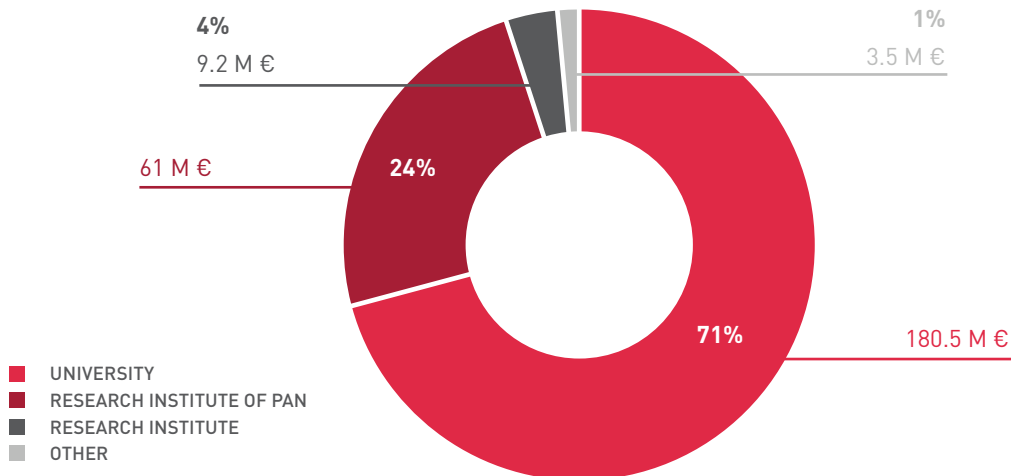
The table presents a ranking of institutions, which in 2016 received NCN funding of over EUR 2.5 M. Once again, among the leaders are the University of Warsaw with 275 applications applications qualified for funding, and Jagiellonian University with 236 projects. Also, in terms of funding granted, first place belongs to the University of Warsaw, second to Jagiellonian University.

The success rate presented in the table is the ratio of the number of proposals selected for funding to the number of applications submitted. The

highest rate among beneficiaries, who in 2016 managed to get funding of more than EUR 2.5 M, 88% - was obtained by the International Institute of Molecular and Cell Biology in Warsaw. Second place (52%) was taken by the Institute of Pharmacology of the Polish Academy of Sciences, while third place went to the Nencki Institute of Experimental Biology, Polish Academy of Sciences with a score of 47%. Among the best universities was the University of Warsaw (39%), Jagiellonian University (38%) and Jagiellonian University Medical College UJ (37%).

## FUNDING OF RE SEARCH PRO JECTS

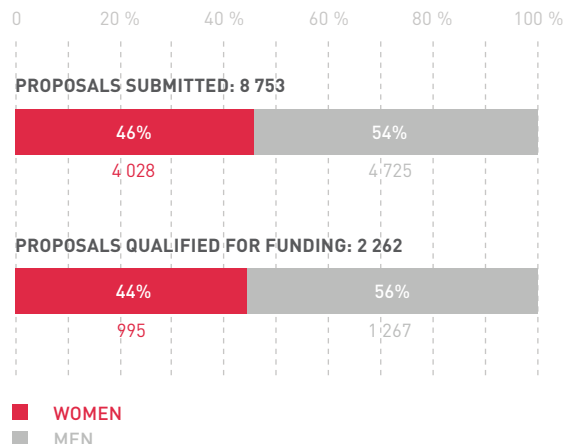
Funding granted to respective categories of beneficiaries in NCN calls concluded in 2016\*.



## PRINCIPAL INVESTIGATORS<sup>1</sup>

In 2016 proposals submitted by women accounted for 46% of the total applications. Effectiveness in applying for grants was slightly lower among women than men; the success rate was 25% and 27% accordingly. 56% of projects awarded funding in 2016 were led by men, while 44% - by women.

**Number of applications submitted and qualified for funding with regard to the sex of the Principal Investigators:**



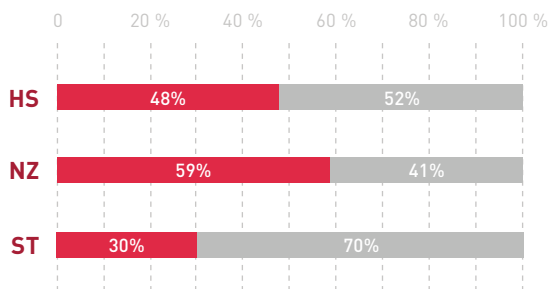
\*The data does not include POLONEZ, TANGO and SYMFONIA.

<sup>1</sup> The sex of Principal Investigators was determined on the basis of their PESEL number. The analysis does not include applicants of the POLONEZ funding scheme and Principal Investigators without a PESEL number.

The highest percentage of women among NCN awardees was found in the PRELUDIUM funding scheme. Women accounted for 58% of all grantees in the 10 th and 11th edition of this programme. The lowest percentage of women Principal Investigators was observed on the MAESTRO 7 scheme, dedicated to advanced researchers, where there were only 2 projects among 13 qualified for funding, led by women.

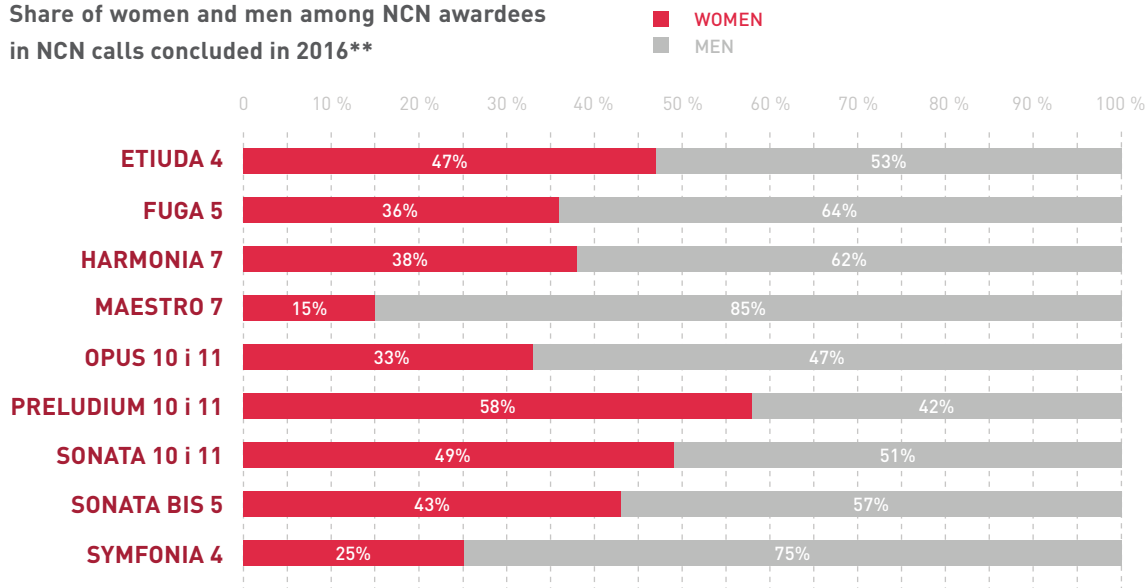
Women dominate among awardees in Life Sciences: 59% of projects awarded within this research area are led by women. Among the awardees in Physical Sciences and Engineering less than 1/3 of the grantees are women.

#### Share of women and men among NCN awardees in NCN calls concluded in 2016 with breakdown into research domains.



## FUNDING OF RE SEARCH PRO JECTS

#### Share of women and men among NCN awardees in NCN calls concluded in 2016\*\*



\*\* The data does not include POLONEZ and TANGO

## FUNDING OF RE SEARCH PRO JECTS

### YOUNG RESEARCHERS

One of NCN's goals is to support researchers starting their scientific career. For this group of researchers, the NCN allocates at least 20% of its funding. According to the Act on Principles of Funding Research young researchers are individuals under 35. In NCN calls concluded in 2016 this groups of scientists accounted for more than half of all grantees.

24%

of all funding spent by the NCN in calls concluded in 2016 was dedicated to financing research projects, scholarships and internships carried out by researchers about to embark on their career in research within the PRELUDIUM, SONATA, FUGA and ETIUDA funding schemes.

47%

of applications were submitted by researchers under 35<sup>2</sup>.

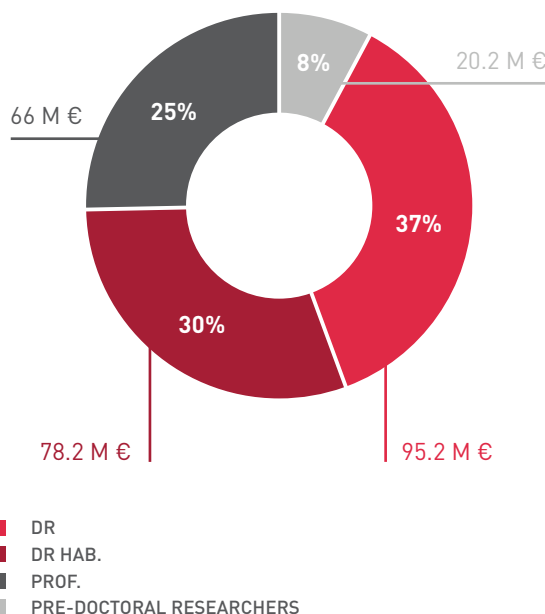
52%

of proposals selected for funding were led by young researchers. of proposals selected for funding were led by young researchers.

The largest group of NCN grantees in calls concluded in 2016 are researchers at the onset of their career. Pre-doctoral and doctoral scientists account for 66% of the total number of grantees. This group of applicants received 45% of the total funding awarded in 2016.


Researchers with a habilitation degree or title of professor account for 34% of awardees in 2016 and received 55% of the 2016 budget dedicated to research projects.

**Share of researchers at different stages of their career with breakdown into the amount of funding granted in 2016.**






# EVALU ATION PROCESS



The NCN's priorities include funding excellent research projects, selected within a two-step peer review process. As a general rule, the NCN Council has adopted two main criteria – the excellence of the research projects and the research portfolio of the investigators.

A merit-based evaluation of proposals is preceded by an eligibility check carried out by NCN Coordinators; they ensure that the applications are complete and fulfill all eligibility requirements. A merit-based assessment of the proposals is made by Expert Teams (group of experts selected by the NCN Council from among distinguished researchers, appointed by the NCN Director).



## NCN APPEAL COMMITTEE

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Applicants may apply against a decision that refuses to award funds to a project within 14 days from the date of receipt of the decision. The appeals are considered by the Appeal Committee of the NCN Council.

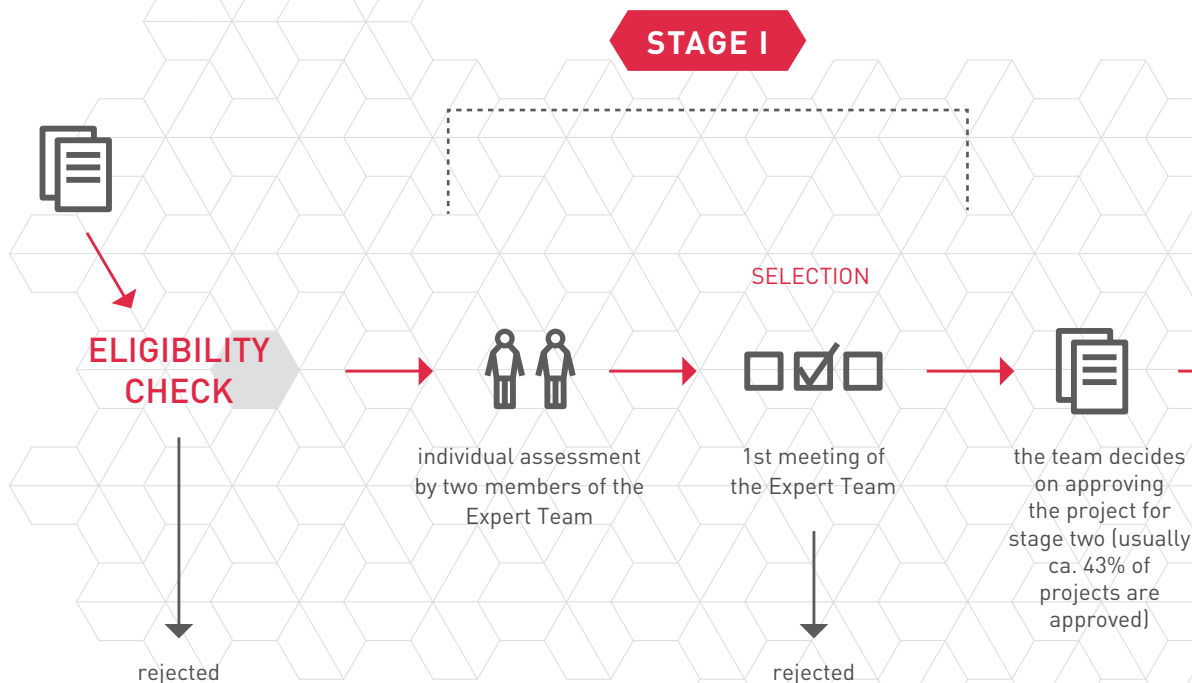
**In 2016** the Committee:

- considered **256 appeals**,
- allocated EUR 2.05 M to **13 projects**,
- commissioned **25 additional reviews**,
- in **12 cases** annulled the director's decision and applications were re-evaluated.

## I STAGE

Applications are assessed by a member of the Expert Team individually. Their marks are a starting point for a discussion in the first expert panel meeting. Decisions concerning rejecting or qualifying a project to the second stage is made

collectively by the Expert Team after discussion. The experts draw up a ranking list of proposals which could be invited to the second step of the evaluation.



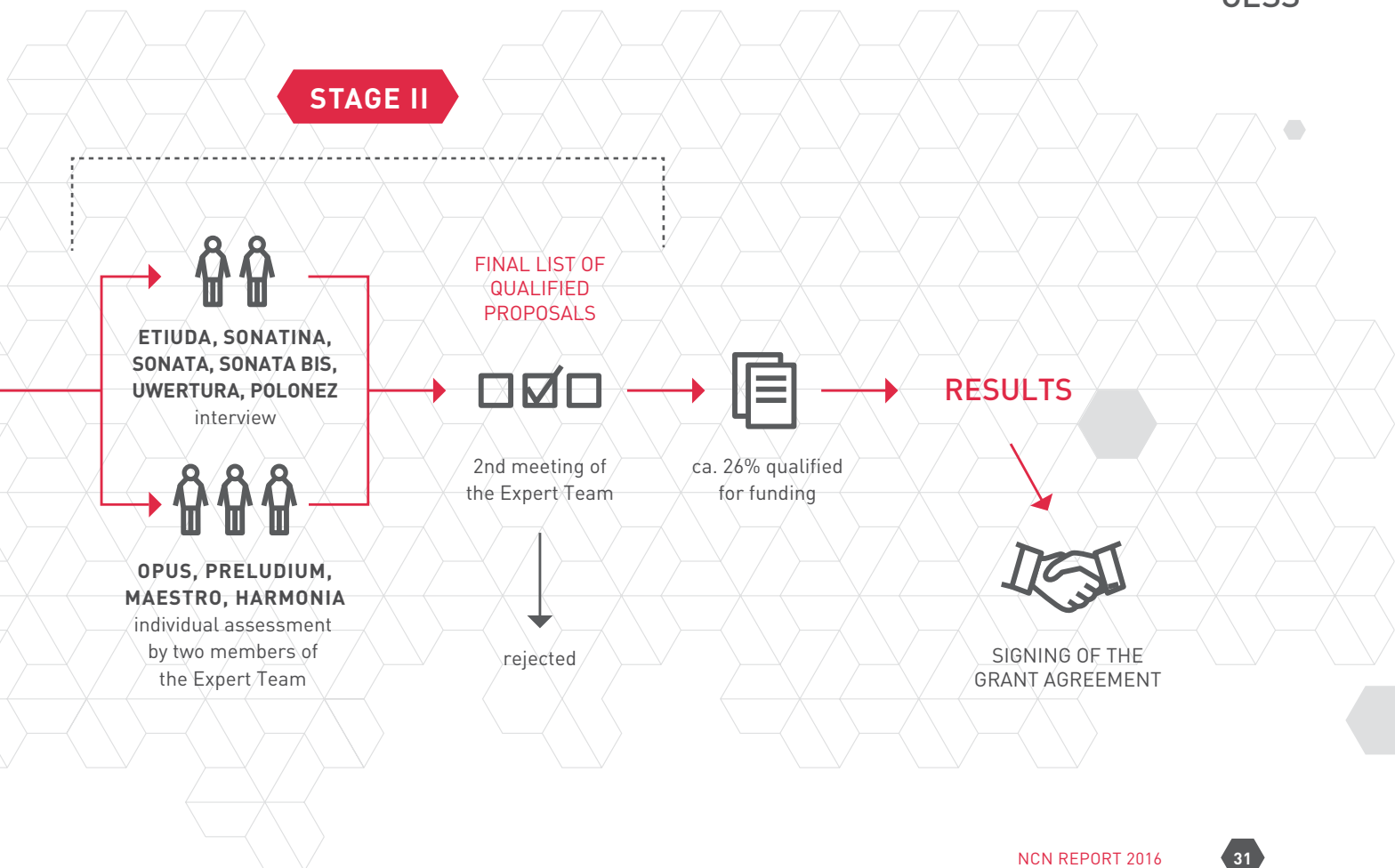
\* Due to the different evaluation procedures, the diagram does not include MINIATURA and TANGO calls.

## II STAGE

Applications are evaluated by external reviewers, including international researchers, and then the proposals are discussed by the Expert Team in the second panel meeting. External reviewers are selected by NCN Coordinators who take into

consideration candidates indicated by the Expert Team. Final scores and the ranking list are set up by the Expert Team. In some funding schemes at the second stage an interview with applicants is also organised.






## EVALUATION PROCESS



# EXPERTS

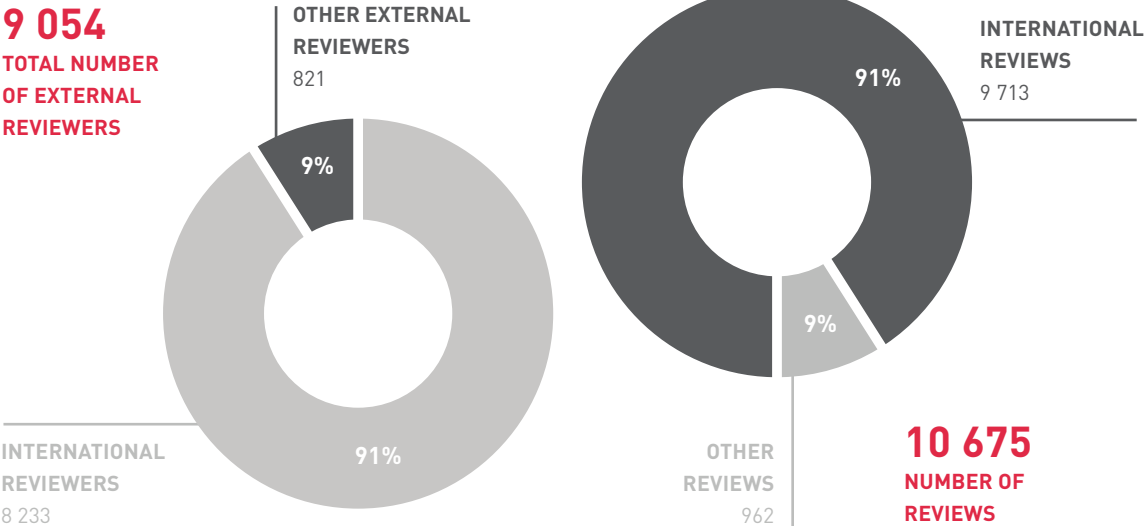
In 2016 NCN appointed 979 experts who worked in 95 teams. The applications were assessed in 3 research domains: HS – by 28 Experts Teams, NZ – 30 Expert Teams, ST – 35 Expert Teams, one interdisciplinary team appointed to evaluate proposals in SYMFONIA funding schemes and one interdisciplinary team in TANGO funding opportunity. In the second stage 9054 external reviewers were involved who provided 10 675 reviews. 91% of external reviewers were international experts, who prepared 9 713 reviews, which accounts for 91% of all assessments.

## Number of Experts with breakdown into research domains:

 <b>HS</b>	273 experts
 <b>NZ</b>	294 experts
 <b>ST</b>	387 experts
 <b>SYMFONIA</b>	13 experts
 <b>TANGO</b>	12 experts



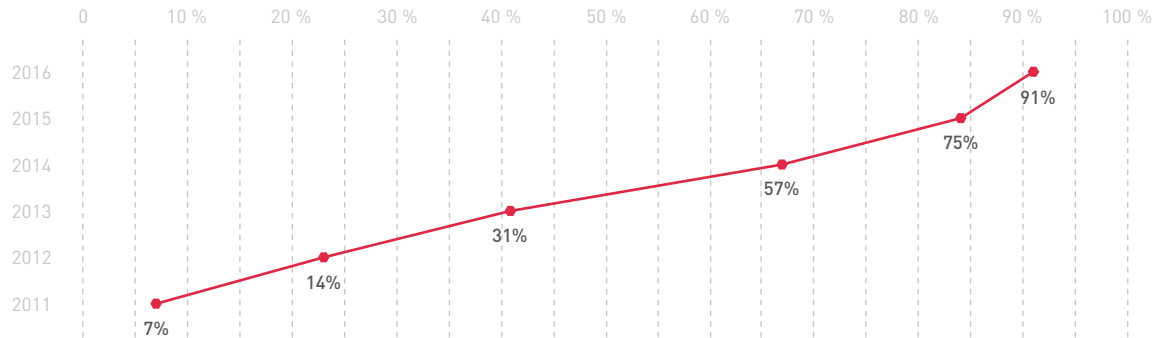
Number of external reviewers and number of reviews provided in 2016.



INTERNATIONAL REVIEWERS

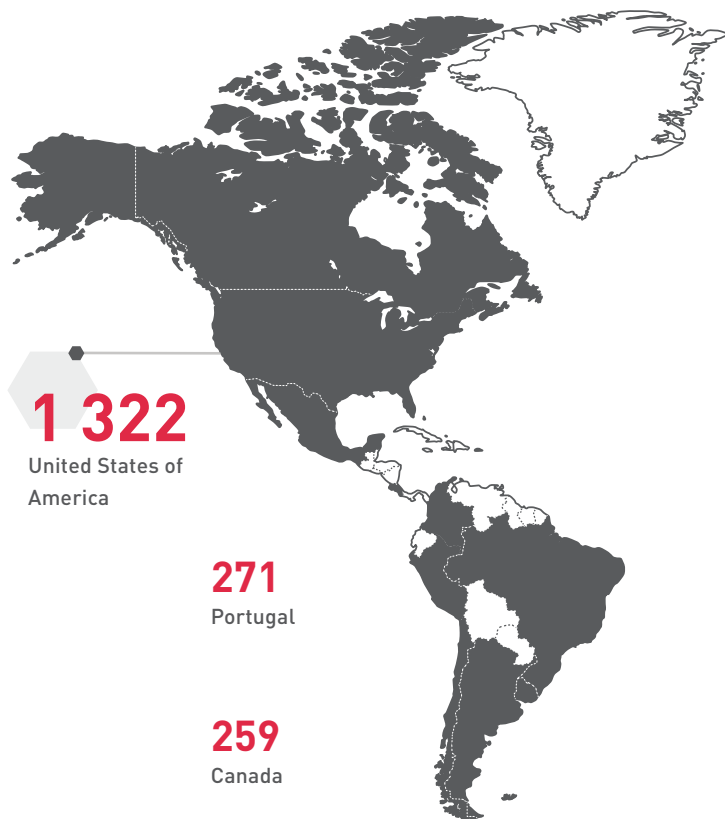
Percentage of international reviews in 2011-2016.

Source: NCN Coordinators, based on data from the OSF submission system.



## INTERNATIONAL REVIEWERS

75	Russia	6	United Arab Emirates
72	Hong Kong	5	Indonesia
69	Israel	5	Peru
65	Norway	4	Morocco
58	Lithuania	4	South Korea
56	Turkey	3	Qatar
55	Romania	3	Vietnam
52	Serbia	2	Armenia
46	Slovenia	2	Brunei
46	Taiwan	2	Yemen
44	Ukraine	2	Lebanon
38	Singapore	2	Luxembourg
36	Bulgaria	2	Macedonia
31	Argentina	2	Monaco
31	Croatia	2	Reunion
27	Malaysia	2	Thailand
25	New Zeland	2	Uruguay
25	Korea	1	Algeria
25	Republic of South Africa	1	Bangladesh
21	Mexico	1	Ethiopia
18	Chile	1	Iraq
18	Estonia	1	Kazakhstan
10	Saudi Arabia	1	Kenya
9	Bielarus	1	Costa Rica
8	Cyprus	1	Kuwait
8	Iran (Islamic Republic)	1	Macau
8	Columbia	1	Malta
7	Egypt	1	Oman
7	Latvia	1	Puerto Rico
6	Iceland	1	Federation of Saint Kitts and Nevis
6	Pakistan	1	Tunisia
		1	Ascension Island



1 322

United States of America

271

Portugal

259

Canada

253

Czech Republic

249

India

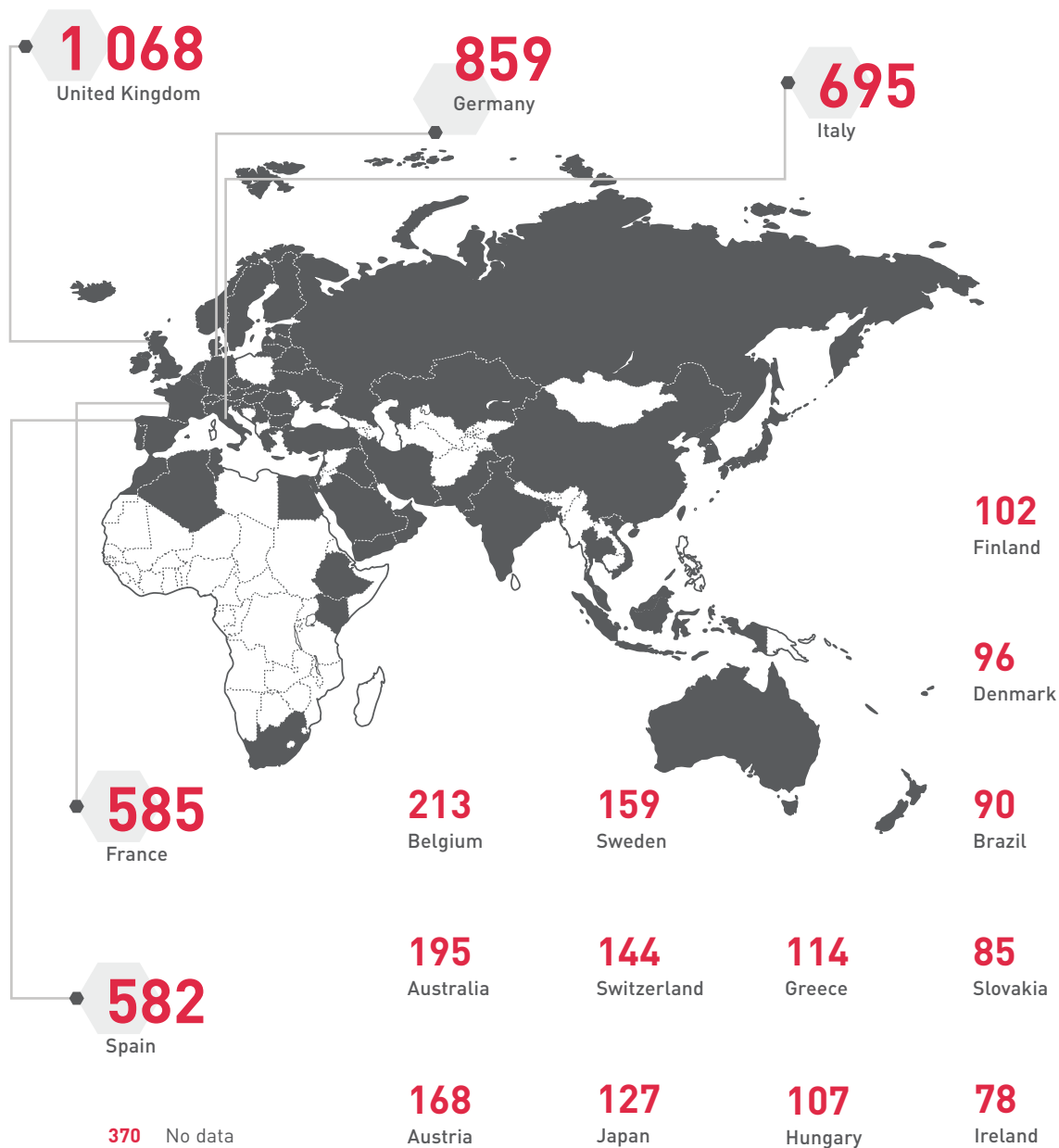
217

China

217

the Netherlands

EX  
PERTS






# PRO JECTS

## IMPLEMENTATION



### MONITORING OF PROJECTS IMPLEMENTATION

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Among NCN duties is the monitoring of research projects, scholarships and internships, as well as the spending of funding granted. The monitoring includes the assessment of annual and final reports, on-site audits. In the event of failure, the NCN director is entitled to withhold or terminate the grant. Assessment of the reports includes a formal and financial check, as well as scientific evaluation of the project results.

### REPORTS

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**In 2016 experts appointed by the NCN assessed:**

- the annual and final reports on the results of research projects granted by the Ministry of Science and Higher Education (MNiSW), monitored by the NCN,
- mid-term, annual and final reports on the results of projects granted by the NCN.

### In 2016 the following reports were assessed:

**118** mid-term report

**4 246** annual report – NCN grants

**68** annual report – MNiSW grants

**4** annual report – International calls for proposals

**301** final reports submitted in 2016 – NCN grants

**2 234** final reports submitted before 2016 – NCN grants

**47** final reports submitted in 2016 – MNiSW grants

**970** final reports submitted before 2016 – MNiSW grants

**TOTAL: 7 988** reports

## AUDITS IN HOST INSTITUTIONS

In order to verify the compliance of the project with the contract signed between the NCN and the grantees, the Centre conducts audits of research projects. Audits are performed by the NCN Audit and Compliance Team according to its annual plan. Grants to be audited are selected on the basis of an analysis of the risks associated with their implementation. However, audits can also be performed in an ad-hoc manner, if information on incorrect implementation of the projects is reported. Projects selected at random may also be checked by the NCN. The audit team consists of a member of the NCN Audit and Compliance Team and a financial and/or scientific expert.

According to the 2016 plan, an audit of 20 projects funded by the NCN was initiated, of which 18 have been completed. Also, 3 audits which started in 2015 were finalised. In addition, 7 ad-hoc audits were performed, and 56 audit reports submitted by NCN grantees were verified. And last but not least, 8291 scientific publications which were a result of NCN-funded projects and 38 proposals put forward to the NCN were verified for plagiarism in the iThenticate programme.

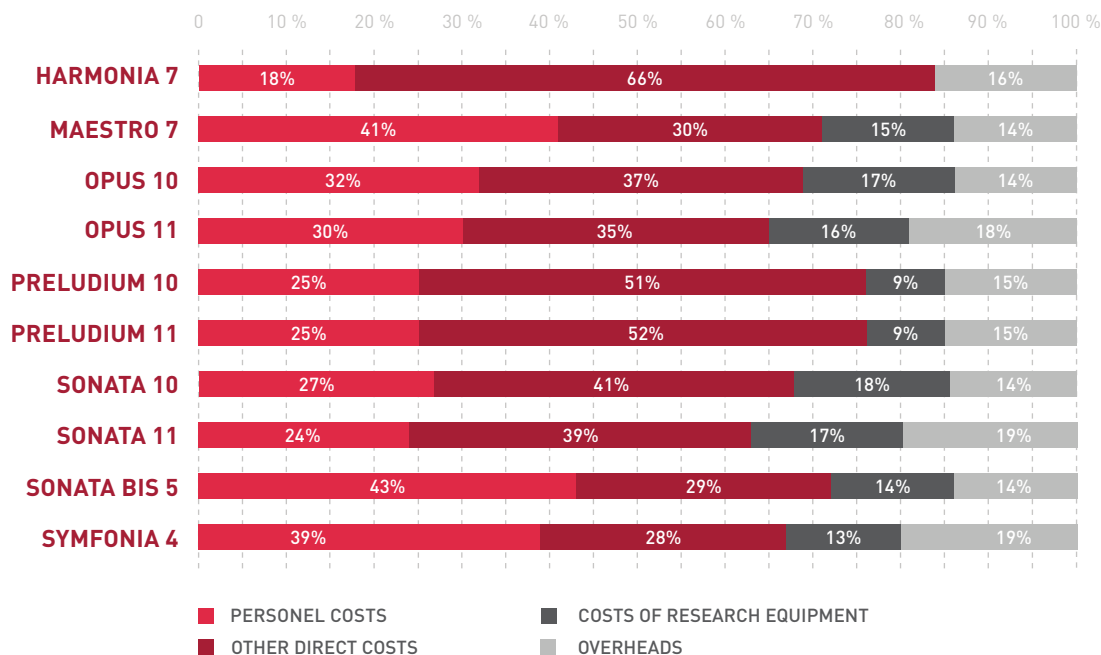
## COSTS IN NCN GRANTS

The amount of funding granted may be spent on different cost categories, including personnel costs, which consume on average 30% of the total project budget (excluding FUGA and ETIUDA). Due to the nature of the FUGA and ETIUDA calls, the share of cost categories look different than in other schemes. In FUGA, the biggest share of funds is spent on personnel costs [74%], whereas in ETIUDA the largest amount falls on internship in the Host Institution abroad [53%] and the scholarship received by the grantee [42%].

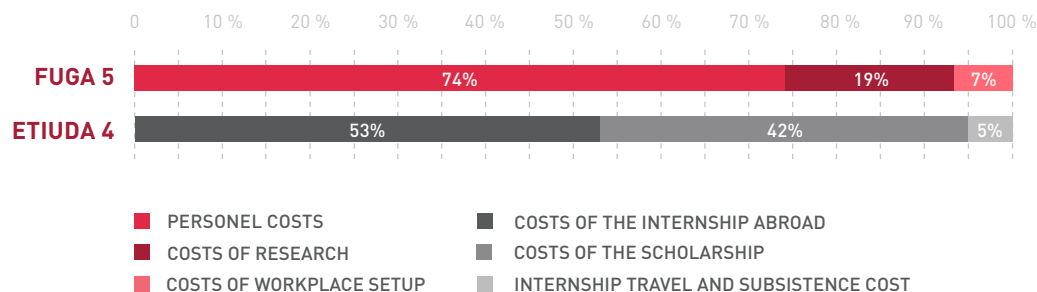
# PROJECT IMPLEMENTATION

Amount of funding and share of cost categories in NCN calls concluded in 2016 (excluding ETIUDA and FUGA).\*

## PROJECT IMPLEMENTATION



Amount of funding and share of cost categories in ETIUDA 4 and FUGA 5 concluded in 2016.



# INTER NATIONAL COOPERATION

In 2016 the NCN launched 8 calls for international research projects organised in multilateral cooperation, two POLONEZ calls for proposals addressed to incoming researchers who want to do research in Poland and BEETHOVEN 2 – a funding opportunity for Polish-German research projects.

Researchers applying for grants within multilateral calls for proposals submit projects carried out by research teams from at least 3 countries participating in the call. In ERA-NET Cofund calls, HERA, NORFACE, ENSUF, SUGI, BiodivERsA,

JPI-EC-AMR and M-ERA.NET, applicants can also receive co-funding from the EU framework programme Horizon 2020.

In 2016 the NCN joined the following initiatives:

**EXPAND** – Coordination and Support Action, co-funded by the EU Horizon 2020

**multilateral programmes:** ForestValue supporting research in innovative bio-based economy and ERA-CAPS – financing research projects in the field of molecular plant sciences.

## CALLS FOR PROPOSALS LAUNCHED IN INTERNATIONAL COOPERATION

### INTERNATIONAL COOPERATION

NAME		FIELD
<b>HERA</b>	Humanities in the European Research Area	Humanities
<b>NORFACE</b>	New Opportunities in the European Research Area	Social Sciences
<b>ENSUF</b>	ERA-NET Cofund Smart Urban Futures	Urban Challenges
<b>SUGI</b>	ERA-NET Sustainable Urbanisation Global Initiative	
<b>EXPAND</b>	Enhancing Co-creation in JPI Urban Europe through Widening Member State and Stakeholder Participation	
<b>BiodivERsA</b>	Consolidating the European Research Area on Biodiversity and Ecosystem Services	Biodiversity
<b>ERA-CAPS</b>	Coordinating Action in Plant Sciences	Molecular Plant Sciences
<b>ForestValue</b>	ERA-NET COFUND on Innovative Forest-based Bioeconomy	Forest-based Economy
<b>Infect-ERA</b>	Coordination of European Funding for Infectious Diseases Research	Infectious Diseases
<b>JPI-EC-AMR</b>	ERA-NET for Establishing Synergies between the Joint Programming Initiative on Antimicrobial Resistance Research and Horizon 2020	Antimicrobial Resistance
<b>CHIST-ERA</b>	European Coordinated Research on Long-term Challenges in Information and Communication Sciences & Technologies	Information and Communication Sciences & Technologies
<b>M-ERA.NET</b>	ERA-NET for Material Research and Innovation	Material Research
<b>QuantERA</b>	ERA-NET in Quantum Technologies	Quantum Technologies
<b>BEETHOVEN</b>	Call for Polish-German research projects	Social Sciences and Humanities; Physical Sciences and Engineering
<b>PIRE</b>	Partnerships for International Research and Education	All fields of basic research
<b>POLONEZ</b>	Fellowship programme for incoming researchers who want to do basic research in Poland	All fields of basic research



## PROJECTS INVOLVING POLISH RESEARCHERS, AWARDED WITHIN MULTILATERAL INITIATIVES:



### HS HUMANITIES AND SOCIAL SCIENCES

- dr hab. Paweł Gancarczyk, Institute of Art of the Polish Academy of Sciences, Sound memories: the musical Past in Late-Medieval and Early-Modern Europe (HERA)
- dr Aleksandra Gliszczyńska-Grabias, Institute of Legal Sciences of the Polish Academy of Sciences, Memory Laws in European and Comparative Perspectives (HERA)
- dr Anna Maria Niedźwiedź, Faculty of History, Jagiellonian University, The heritagization of religion and the sacralization of heritage in the contemporary Europe (HERA)
- dr Agata Dziuban, Faculty of Philosophy, Jagiellonian University, Disentangling European HIV/AIDS Policies: Activism, Citizenship and Health (HERA)
- dr hab. Tomasz Basiuk, Institute of the Americas and Europe - American Studies Center, University of Warsaw, Cruising the 1970s: Unearthing Pre-HIV/AIDS Queer Sexual Cultures (HERA)
- dr hab. Szymon Marcińczak, Faculty of Geographical Sciences, University of Łódź, Smart Shrinkage Solutions - Fostering Resilient Cities in Inner Peripheries of Europe (ENSUF)



### NZ LIFE SCIENCES

- dr hab. Monika Joanna Piotrowska, Faculty of Mathematics, Informatics and Mechanics, University of Warsaw, Effectiveness of infection control strategies against intra- and inter-hospital transmission of multidrug resistant Enterobacteriaceae - insights from a multi-level mathematical network model (JPI-EC-AMR)
- prof. Jakub Kronenberg, Faculty of Economics and Sociology, University of Łódź, Enabling green-blue infrastructure in complex social-ecological regions - system solutions to wicked problems (BiodivERsA)
- dr hab. Wiktor Kotowski, Faculty of Biology, University of Warsaw, Restoration and prognosis of peat formation in fens – linking diversity in plant functional traits to soil biological and geochemical processes (BiodivERsA)
- prof. Nuria Selva Fernandez, Institute of Nature Conservation of the Polish Academy of Sciences, Functional connectivity and ecological sustainability of European ecological networks - a case study with the brown bear (BiodivERsA)
- prof. Piotr Tryjanowski, Faculty of Veterinary Medicine and Science about Animals, Poznań University of Life Sciences, Connectivity of green and blue infrastructures; living veins for biodiverse and healthy cities (BiodivERsA)

## INTERNATIONAL COOPERATION

## QUANTERA

QuantERA is a network of 32 organisations from 26 countries, coordinated by the National Science Centre, Poland, supporting research in Quantum Technologies. It launched its activities on the 1st of November 2017. With a budget of over EUR 34 M, including co-funding from the European Commission's Horizon 2020, QuantERA will support international research projects in the field of Quantum Technologies.

The launch of the call for proposals will be complemented by a range of additional activities aimed at stimulating cooperation within the research community, creating and maintaining links

between academia and industry, building a tool-kit on responsible research and innovation in QT, exchanging best practices, and engaging in a dialogue with policy makers about the design of future funding instruments. Altogether it will facilitate in taking further steps on the road to unlocking the widely recognised industrial potential of QT in response to current societal needs and for the benefit of the public at large.



### QuantERA partners:

Austria	Czech Republic
Belgium	Norway
Bulgaria	Poland
Denmark	Portugal
Finland	Romania
France	Slovakia
Germany	Slovenia
Greece	Spain
Hungary	Sweden
Ireland	Switzerland
Israel	The Netherlands
Italy	Turkey
Latvia	United Kingdom



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 731473



## BILATERAL COOPERATION

### BEETHOVEN 2

In September 2016 the NCN, in cooperation with the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) announced the second edition of the BEETHOVEN call for Polish-German research projects. Under the 2016 call, researchers may apply for grants in the fields of Humanities and Social Sciences (HS), as well as selected fields of Physical Sciences and Engineering (ST). Under this call 155 proposals were submitted: 72 in the area of HS and 84 in ST. Call results will be published in October 2017.

### Polish-Lithuanian Cooperation

On the 16th of November 2016 the NCN and the Lithuanian Research Council (Lietuvos mokslo taryba, LMT) signed a memorandum of understanding on cooperation in funding research. Pursuant to this document in the second half of 2017, both agencies will launch a call for Polish-Lithuanian projects in all areas of research funded by the NCN.

### POLONEZ

In 2016 the NCN opened two POLONEZ call for proposals targeted at incoming researchers who want to carry out research in Poland. Under the POLONEZ 2 and 3 calls, 699 proposals were submitted. The same year NCN concluded POLONEZ 1 and 2. Within these calls, thanks to joint NCN

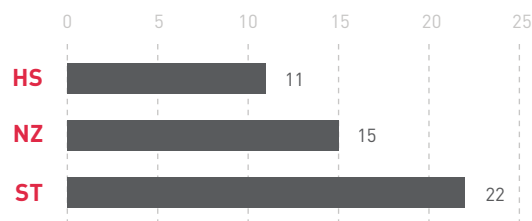
and European Commission funding, 73 researchers were awarded fellowships in host institutions in Poland.



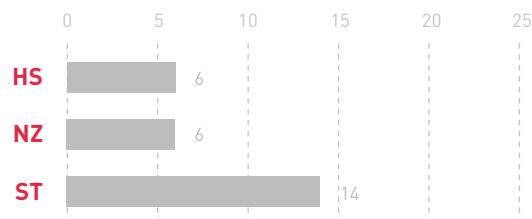
The POLONEZ programme has been co-funded within the Marie Skłodowska-Curie Actions Cofund (Horizon 2020, grant agreement no 665778).

## INTERNATIONAL COOPERATION

### POLONEZ 1 awardees



### POLONEZ 2 awardees



# EVENTS

## NCN'S 5TH ANNIVERSARY

On 4th March, the National Science Centre (NCN) celebrated its 5th anniversary. The celebration was inaugurated by the conference entitled Best practices in supporting outstanding scientists and helping them successfully apply for ERC grants, co-organised by the NCN and the European Research Council (ERC). The event was addressed to researchers conducting their research in Poland, representatives of Polish universities and research institutes, as well as European research funding organisations.

The final highlight of the Centre's 5th anniversary was the gala event held at the Juliusz Słowacki Theatre, where the most significant NCN's achievements from 5-year's history were presented. The opening address was given by the Minister of Science and Higher Education dr Jarosław Gowin, who emphasised the importance of basic research. Among conference speakers were also prof. Jean-Pierre Bourguignon, the President of the ERC, prof. Zbigniew Błocki, NCN's Director and prof. Michał Karoński, Chair of the NCN Council.



## 2016 NCN OPEN DAYS

The NCN Open Days is an event which is organised annually in a different academic centre in Poland. It gives both the research community as well as the administration staff of Polish universities an opportunity to learn about NCN's research funding portfolio. Participants can also participate in workshops on how to monitor the implementation of NCN-funded projects and the peer review process. The 4th edition of this event was held at the University of Warmia and Mazury in Olsztyn on May 11-12, 2017.



## NCN 2016 AWARD

On the 12th of October 2016 the NCN Award was granted for the fourth time. This award is conferred to researchers under 40 for notable achievements in basic research in three categories:

- Arts, Humanities and Social Sciences,
- Physical Sciences and Engineering,
- Life Sciences.

The awardees receive EUR 12 000 each, which is funded by enterprises involved in supporting research.

In the field of Arts, Humanities and Social Sciences, the award was granted to dr hab. Marcin Szwed from the Institute of Psychology, Jagiellonian University, for large-scale research on the

plasticity of the human brain in people with impaired eyesight and hearing. The team he coordinates has been successful in disproving some long-standing theses on the division of the brain into separate sense-related parts. The award is sponsored by **Grupa Azoty S.A**

The laureate of the award in Life Sciences is dr hab. Katarzyna Starowicz-Bubak from the Institute of Pharmacology of the Polish Academy of Sciences. Among her outstanding achievements is her discovery of the role of the endocannabinoid system in the development and treatment of chronic pain; she has also developed a new pharmacological approach to the therapy of osteoarthritis-related pain. Her award is sponsored by **Biprostal S.A.** and **Koksoprojekt BIS Sp. z o.o.**

The third laureate of the NCN 2016 Award, in the field of Physical Sciences and Technology, is professor dr hab. Mikołaj Bojańczyk from the Institute of Informatics, University of Warsaw. The award committee has recognised his outstanding contribution to automata theory and logic. The award is sponsored by **EDF Polska S.A.**



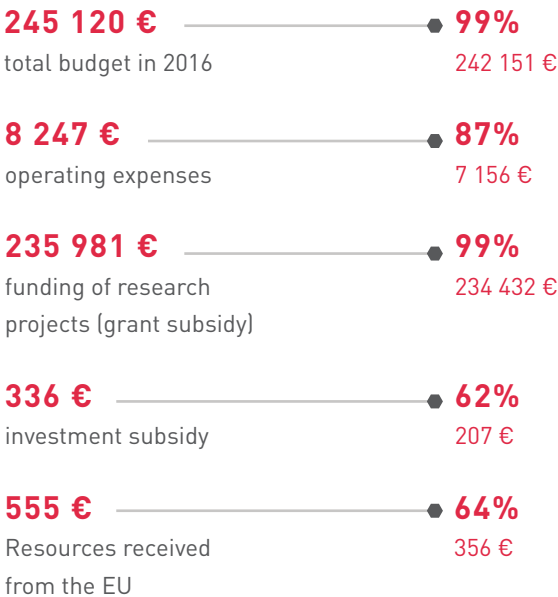
## PROJECT IMPLEMENTATION



# BUDGET

## AND ACCOUNTS

### SUBSIDIES:



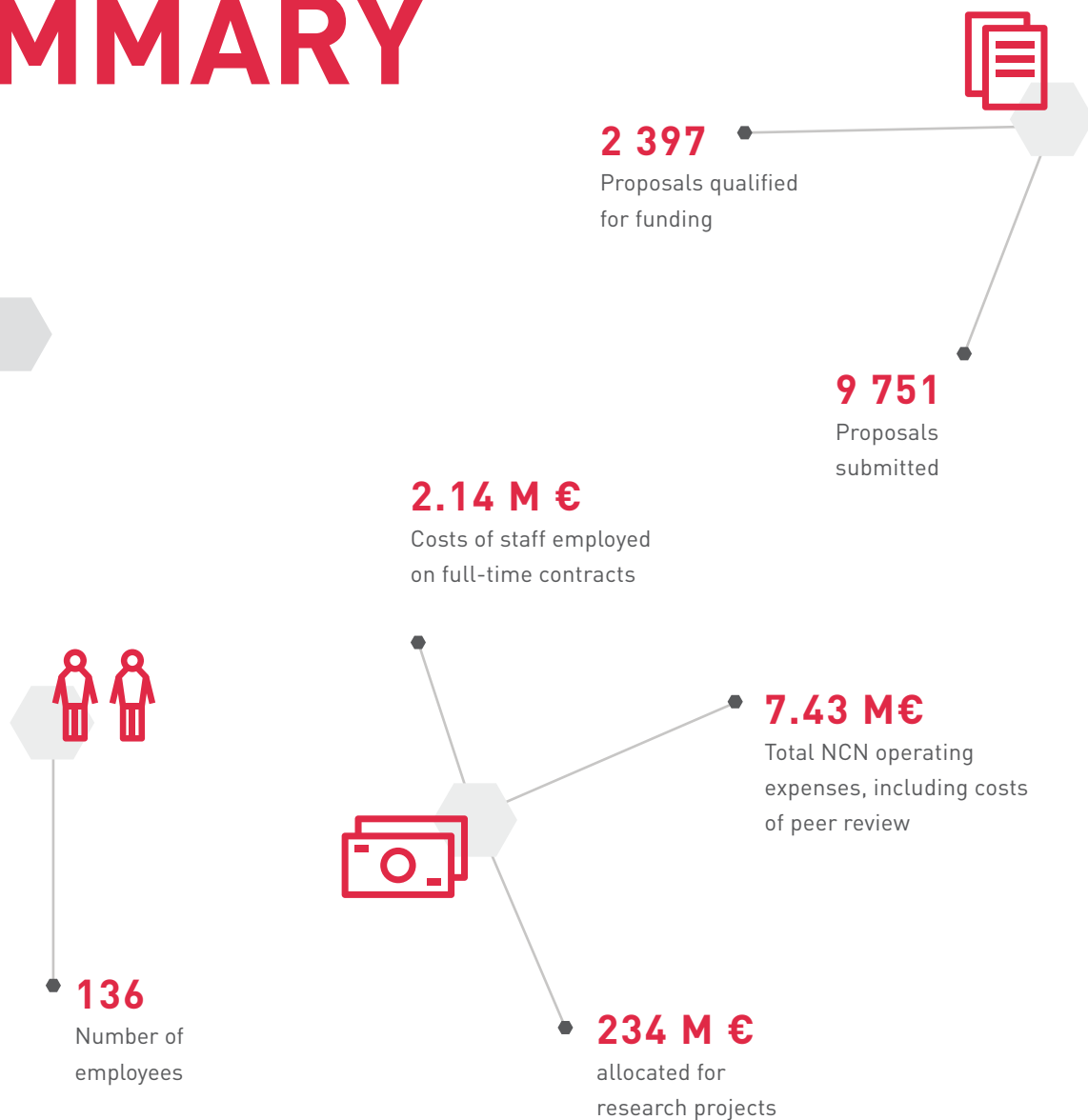
\*\* execution of the financial plan in % calculated on the basis of non-rounded numbers

Grant subsidy in 2016. Execution of finances broken down into types of funding schemes.

OPUS	122 719
PRELUDIUM	15 034
SONATA	28 316
SONATA BIS	19 657
HARMONIA	13 325
MAESTRO	19 423
FUGA	5 282
ETIUDA	2 549
SYMFONIA	5 853
POLONEZ	647
ASPERA	20
JPI CH	18
CHRIST-ERA I	80
NORFACE	50
JPND II	32
CHRIST-ERA II	87
BEETHOVEN	843
HERA Uses of the Past	450
JPI HDHL Nutrition and Cognitive Function	21
Składki członkowskie	26

# SUMMARY

2016



# RESEARCH STORIES







## SONATA 4

NCN Panel:



HS 6

Call concluded on the  
**29th April 2013**



**I like you and I feel the way you do: The  
role of interpersonal attraction in affective  
contagion**

**dr Monika Wróbel**, University of Łódź

Emotions are contagious. Being around cheerful people can cheer us up, and dealing with someone sad can bring ourselves down. In psychological literature, this phenomenon is referred to as affective contagion or the social induction of affect.

Initially, research on the phenomenon consisted in exposing participants to films or photographs of people showing emotions and testing whether such exposure would influence the way the participants feel. Usually the analyses were carried out without paying attention to social context, ignoring the characteristics of the people appearing in the films and photographs as well as the impression they made on the participants. Some newer studies, however, have shown that in certain social contexts (particularly in relations between people who like each other), affective contagion should be more likely, while in others (particularly in relations between people who do not like each other) the process may be blocked or even discordant affect may occur.

That suggestion was the main inspiration for the research we have carried out in the project. Although the literature provided considerable evidence that supported the notion that liking plays an important role in affective contagion, the majority of this evidence was indirect. We were wondering what the precise role of liking in affective contagion was, i.e., whether emotions and moods expressed by disliked people would “infect” others and – if so – what the direction of this induction would be.

We looked for the answers to these questions in a series of eight experiments. In each of them we manipulated the variables that were related to liking. The person expressing emotions was thus presented either in a way that en-

hanced liking (e.g., someone whose views were similar to those held by the participant, or someone characterized by positive personality traits) or in a way that impaired liking (e.g., someone whose views were dissimilar to those held by the participant, or someone characterized by negative personality traits). The results confirmed that this kind of manipulation influenced affective contagion, but only when the person expressing the emotion was cheerful (participants “caught” his/her happiness only when they liked him/her, whereas the disliked happy person evoked no reaction).

A sad target person, on the other hand, “infected” participants with his/her sadness regardless of the way he/she was presented. In other words, participants “caught” his/her negative affective state not only when they liked him/her but also when they disliked him/her. The result supports the notion shared by some researchers according to which negative states are more contagious than positive ones. This explains why we often find it difficult to remain indifferent to other people’s sorrow even if we do not particularly like them.

## DR MONIKA WRÓBEL

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Social psychologist. Works as an associate professor at the Institute of Psychology, University of Łódź. Her research deals with emotions in interpersonal relations, specifically affective contagion. Author of numerous papers published in Basic and Applied Social Psychology, Social Psycholo-

gical and Personality Science, European Journal of Psychological Assessment, among others, and a monograph titled *Zarażenie afektywne. O procesie transferu emocji i nastroju między ludźmi* [En. *Affective contagion. On the process of emotion and mood transfer between humans*].





## OPUS 4

NCN Panel:



HS 3

Call concluded on the  
**29th April 2013**

Children's toys on Polish territories until  
the end of the 19th century

prof. Dorota Żołędź-Strzelczyk,  
Adam Mickiewicz University in Poznań

Like childhood itself, toys have only relatively recently become a subject of interest for Polish historiographers: hence the results of their research are unsatisfactory. The project's aim is to comprehensively present the history of toys from their emergence to their expansion, function, use, to their significance for a child's life and development. The place of children's toys in history has changed over the course of time: initially absent and neglected, they would gradually be paid more notice, eventually having their role emphasised as particularly important in children's development and education. This process of recognition was a long one, just as the attempts to understand the idea of childhood were. The research in the project offers a complex and multifaceted approach to the subject. The use of information from various sources – written, material and iconographic – will provide a new outlook on many problems related to the condition of being a child and the role of toys in their life. In particular historical periods, Polish children played with toys similar to those played by children in other parts of Europe. Toys were produced by local manufacturers or imported by merchants to be sold at market stalls or in shops. Children's toys manifested, on the one hand, a certain traditionalism (certain types of toys seem to have "always" been around), while on the other, they have changed: both technologically and socially. At some point, artistic and aesthetic aspects were internalised in the manufacturing process. The kinds of toys children played with depended on their families' economic and class status as well as tradition. Toys and their attributes – toys – used to be and still are important for a child's living, regardless of the time and place

it happens to inhabit. Irrespective of social, religious and family conditions, children have always played, using various objects to serve their purposes. The basic repertoire of toys used to be practically settled and uniform. Huge changes came in the 19th century, when industrial manufacturing of toys became popular, triggering changes in distribution, mass popularisation and far-reaching diversification.

Thanks to this research project it will be possible to rebuild the catalogue of toys played by children on Polish territories from the Middle Ages until the outbreak of WWI, and to show the role (assumed and actual) toys have played in children's development over different periods of history. The reconstruction effort will draw upon specimens stored in museums and collections, iconographic representations and descriptions in various records.

The results of the research will contribute an important step towards learning and restoring the history of childhood. A book will be published on the history of toys on Polish territories in the period up until the First World War. It will present a repertoire of old toys and offer discussions on specific related problems: means and places of manufacturing, commerce, quantitative and qualitative changes in manufacturing, the position of toys in children's education in theory and in reality, toys as seen through a child's eyes and their place in children's games, and finally – the didactic and social functions of toys.

The research team investigating the history of old toys comprises Izabela Gomułka (archaeologist), Katarzyna Kabacińska-Łuczak (education historian), Monika Nawrot-Borowska (education historian).



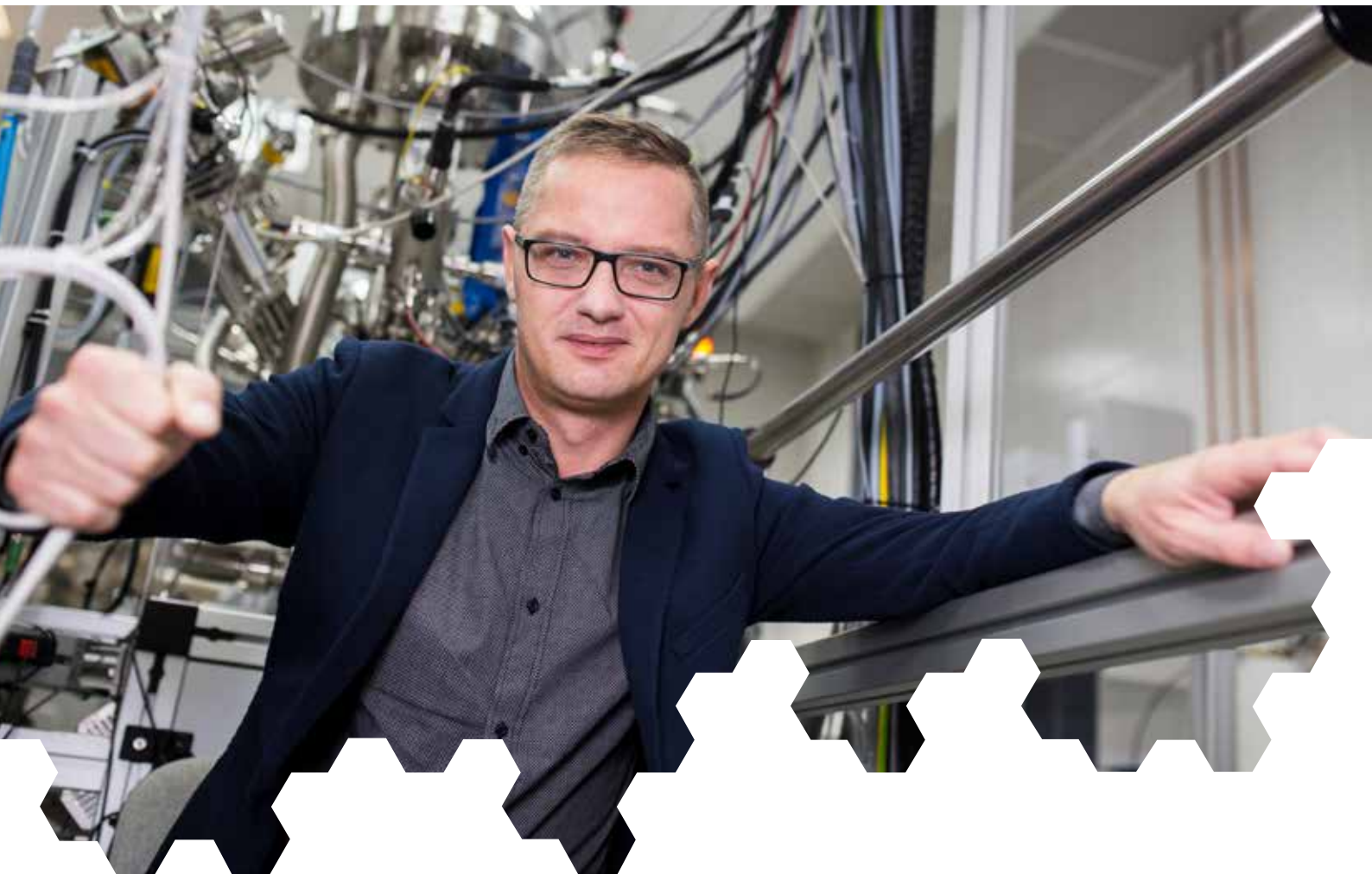
## PROF. DOROTA ŻOŁĄDŹ-STRZELCZYK

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Historian, author, co-author and editor of books and papers on the history of education in the Old Polish period, incl. „Ideały edukacyjne doby staropolskiej”, Warszawa-Poznań 1990, „Peregrinatio academica. Studia młodości polskiej z Korony i Litwy na akademiach i uniwersytetach niemieckich w XVI i pierwszej połowie XVII wieku”, Poznań 1996, „Dziecko w dawnej Polsce”, Poznań 2002, 2006, „Szkoty w Wielkopolsce. Od średniowiecznych początków do reform Komisji Edukacji Narodowej”, Poznań

2010, „Codzienność dziecięca opisana słowem i obrazem.” (with K. Kabacińska,) Warszawa 2012. Publishes in numerous Polish historical journals. Her research interests include: the history of education in the Old Polish period, the history of childhood and childcare, women in old Poland, the history of formal education in the Wielkopolska region in the Old Polish period, the history of the Commission of National Education, educational travels from 16th to the 18th centuries, Old Polish educational precepts, the history of children's games and toys.





## SONATA BIS 5

NCN Panel:



ST 3

Call concluded on the  
**29th January 2016**



**Disentangling surface and bulk electronic  
structure of TiO<sub>2</sub>-doped materials under  
in-situ conditions**



**dr hab. Jakub Szlachetko,**  
Jan Kochanowski University in Kielce

In 1972 Fujishima and Honda (Nature 238, 37-38, 7 July 1972) published a study that marked a watershed in the conversion of light into electrochemical energy. The study was concerned with the electrochemical photolysis of water using a semiconductor and involving UV-Ai radiation. Unfortunately, to this day it remains a substantial challenge to build a device for the production of solar fuels, such as hydrogen, similar in scale and efficiency to that of fossil fuels. In order for hydrogen to be able to successfully compete with petrol as a motor fuel, its price – according to the United States Department of Energy – should be below \$3.30 kg<sup>-1</sup> (production, shipment, dosing included). Most research in this area is carried out using semiconductors with a relatively wide band gap, i.e. the energy difference between non-conduction and conduction bands, which affects the electrical qualities of materials. One such compound is titanium dioxide, TiO<sub>2</sub>, currently the most commonly used photocatalyst, employed in the conversion of solar radiation into chemical bonds. In spite of its high catalytic efficiency, its use requires excitation in the UV-regime because of its wide band gap (approx. 3.2 eV). A common strategy for improving visible light absorption is through modifying (doping) the semiconductor's structure to reduce the gap. TiO<sub>2</sub> is doped with the 3d group elements from the periodic table, or with light elements such as nitrogen, carbon or sulphur, which shift the conduction band or valence band boundary to thus reduce the band gap. Although the doping process causes increased visible light absorption, in many cases it does not result in improved catalytic activity of the material; on the contrary, it causes its decrease.

The project's main goal is to investigate the surface and bulk electronic structure of TiO<sub>2</sub> doped with carbon, nitrogen and sulphur. To that end, we use our own methodology, combining in-situ resonant X-ray emission stereoscopy (RXES) and theoretical approaches, to determine the lowest occupied and highest unoccupied Ti electronic states. The use of X-rays in the project is of key significance, since it allows for investigating the electronic structure under the material's real working conditions, i.e. in reducing and oxidising atmosphere and at different temperatures. We want the research to help us understand why increased absorption of visible light in the doped titanium dioxide does not translate into increased catalytic activity. Since chemical efficiency is described by the number of surface electronic states available for reaction, the effects of doping on the surface electronic structure thus need to be determined.

The differentiation of the roles of the surface and bulk electronic structures will allow for an in-depth understanding of photocatalytic qualities of doped TiO<sub>2</sub>, and – as a result – may be instrumental in further development of chemical or pharmaceutical uses. Research on the qualities of titanium dioxide may contribute significantly to facilitating the process of generating energy and lead to a step forward in the search for cheap, renewable energy sources.

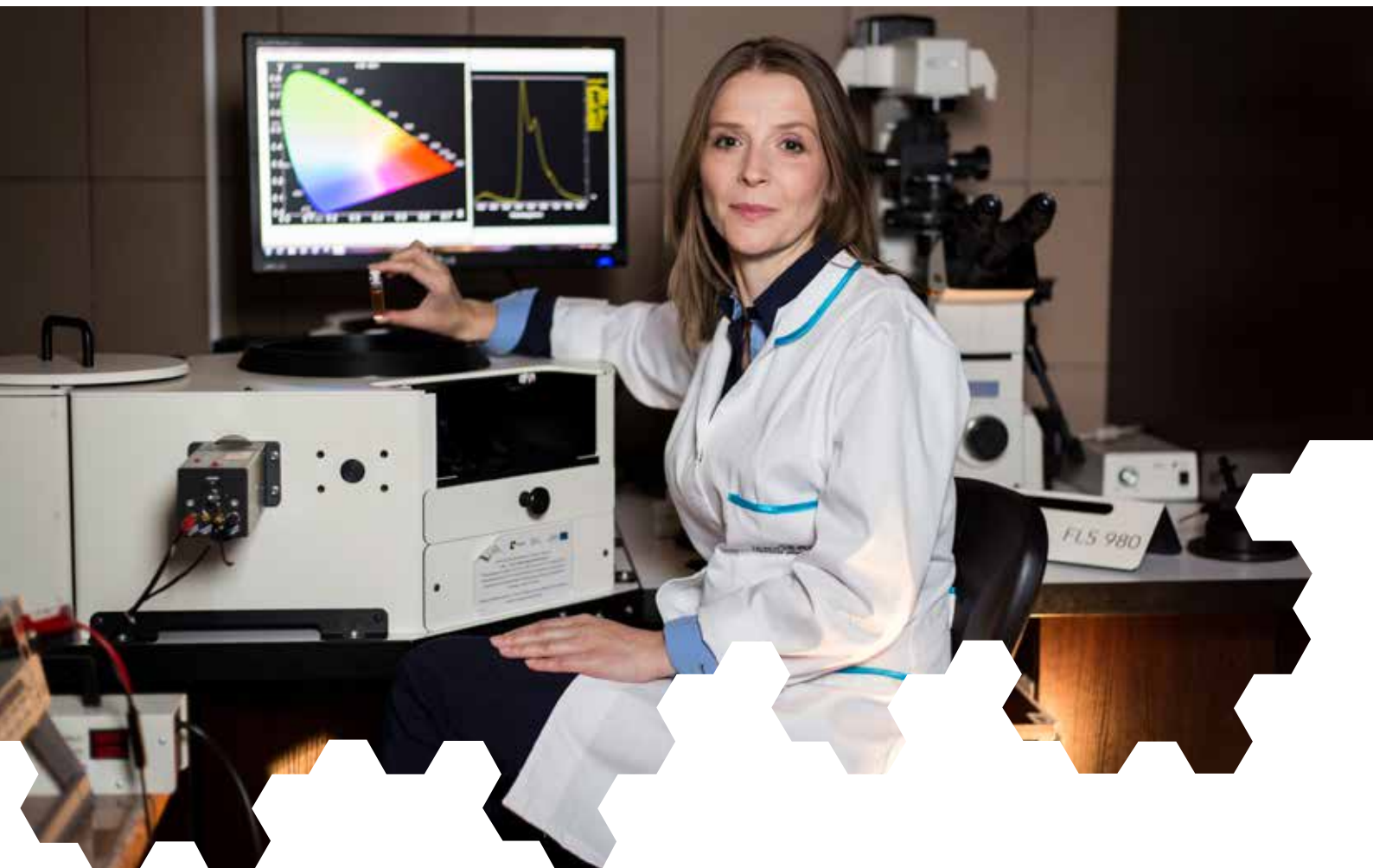


## DR HAB. JAKUB SZLACHETKO

After graduating in 2003, I worked as associate professor at the Institute of Physics, Jan Kochanowski University in Kielce, while continuing my doctorate work at the University of Fribourg in Switzerland. It was then that I had my first contact with high-resolution spectroscopy, working at Professor Jean-Claude Dousse's laboratory. In 2007, after obtaining my doctorate degree, I was granted a scholarship for a research stay at the European Synchrotron Radiation Facility in France. The aim of my project was to

build a crystal spectrometer for ID21 X-ray microscopy. From 2007-2010, I continued my X-ray spectroscopy research in Switzerland, and in 2013 I joined the SwissFEL project. Currently, I work at the Institute of Physics, Jan Kochanowski University in Kielce, where I am continuing research on the use of spectroscopy on synchrotronic sources and XFEL for the investigations into electron systems in chemical and photochemical processes, as well as investigations into non-linear X-ray absorption.





## FUGA 1

NCN Panel:



ST 4

Call concluded on the  
**30th May 2012**

Research of electroluminescent materials  
for use in optoelectronic devices

dr inż. Gabriela Wiosna-Sałyga,  
Lodz University of Technology

The main goal of the project was to provide spectroscopic characteristics of electroluminescent materials that can be of potential use in optoelectronic devices, such as organic light emitting diodes (OLED) and organic light-emitting transistors (OLEFET). The latter are a new generation of devices that combine emission properties of OLED and typical electrical properties of field effect transistors. Materials used in organic electronics must meet numerous conditions. Chief among them are high solid-state emission efficiency, good conductivity capabilities (for holes and electrons alike), the capability to form thin layers, thermal stability, resistance to oxygen and humidity, and emitted light colour purity.

With a view to developing the proper active layer for optoelectronic devices, several materials have been scrutinized, including small-molecule ones and polymers. In order to verify the legitimacy of their use as emitters in light-emitting devices, photophysical research has been conducted in solution and in solid state. In the project, particular attention has been paid to host-guest systems, in which light-emitting dopant have been dispersed in a polymer matrix. In order to learn the mechanism of energy transfer between the molecules of the matrix and those of the emitter, detailed spectroscopy studies have been conducted: measurements of steady-state and time-resolved fluorescence with determining emission quantum yield, supplemented with studies of spectrally-resolved thermoluminescence. It has been established that the right match of energy levels of the matrix and the guest ensures effective energy transfer and results in efficient luminescence of

the emitter. The most promising systems have been tested as active layers in the produced and characterized OLEDs.

Attempts have been made to develop an ambipolar material and use it in a horizontal light-emitting field-effect transistor. Tests have been carried out both on one-component organic layers and on blends composed of n- and p-doped semiconductors. An alternative solution aimed at the creation of a light-emitting transistor has also been proposed. A vertical transistor with an evaporated gate electrode inserted between the hole and the electron transporting layers has been constructed and characterised, its materials selected in such a way as to enable it to create a light-emitting exciplex. A method of controlling the current and the colour of the emitted light in a vertical organic field-effect transistor has been developed.

The results of the project's research will help in understanding the mechanisms of physical processes such as excitons formation and their radiative recombination, lying at the foundations of the operation of electroluminescent devices. The knowledge gathered in the course of the research can be used in designing and producing more efficient optoelectronic devices.

## DR INŻ. GABRIELA WIOSNA-SAŁYGA

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Graduated from the Faculty of Chemistry, Lodz University of Technology. In 2009 she received her doctorate in chemistry at the Institute of Physical Chemistry of the Polish Academy of Sciences for her research on the relations between the structure, dynamics and reactivity of organic molecules, including systems with the hydrogen bond. Dr Gabriela Sałyga-Wiosna's current intere-

sts concentrate on spectroscopy (in particular, emission spectroscopy) of materials that are of potential use for optoelectronics. She is involved in development, production and characterisation of optoelectronic devices (mainly OLEDs) and research on the mechanisms of processes responsible for effective emission of light in this category of devices.







## ETIUDA 3

NCN Panel:



NZ 8

Call concluded on the

**22nd June 2015**

Diversity and ecology of tardigrades (Tardigrada) of the Svalbard Archipelago with regard to the climate and theory of islands biogeography

Krzysztof Zawierucha MSC,  
Adam Mickiewicz University in Poznań

The Arctic is one of the places on our planet we very often get to hear of in reports on climate change, which indeed has an impact on this frozen region of the Earth, causing ice to melt and retreat. This influence into changes of the Arctic's vulnerable ecosystems. Climate change influence on: animals to nest earlier in their places of reproduction, changes in the composition of food base and the fast organism succession in new ice free locations, which – in turn – triggers changes in the distribution patterns of many species. The model organism in my study are tardigrades, animals whose average size is 0.3 mm; in English science they are referred to as water bears (seen under a microscope they resemble miniature bears). These organisms are well-known for their resistance to extreme conditions. They are constant part of the Arctic's animal microcosm. They inhabit mosses, lichens, soil and even the surface of glaciers.

My study site is the Svalbard Archipelago, located in the European part of the Arctic, consisting of several dozen islands. The climate of the archipelago is shaped by sea currents: warm and cold. In this area different types of glaciers abound, and on mountain slopes plankton-eating birds nest. In my research I described the positive effect of guano from the Arctic birds' colonies on the densities and size of tardigrades in tundra ecosystems. I have also showed that on glaciers unique species may occur, which do not occur in tundra. Apart from that, I have described the function of these microscopic animals in glacial ecosystems.

The next stage of the research is the study of tardigrades' distribution patterns across the islands of Svalbard, with regard to the size of the island and the influence of

sea currents. This will allow us to approach the question whether the characteristic of an island and climate change affect not only large polar bears but also microscopic water bears.

For a biologist, the Arctic is a special place where the human impact on the environment is relatively low, where young ecosystems are present, with large seabird colonies which fertilise the poor in nutrients land habitats. Our knowledge on the microfauna and changes of extreme ecosystems (such as glaciers) is still scant. The project is all the more important given the increasing pace of climate change. Carrying out research of animals inhabiting extreme environments is a serious contribution to the field of biodiversity, ecology or biogeography. It may serve as a point of departure for further research in conservation, which will enable us to learn the relations between area and the number of species inhabiting them, or give us insights into astrobiology.

## KRZYSZTOF ZAWIERUCHA MSC

Doctoral candidate at the Department of Animal Taxonomy and Ecology (Faculty of Biology), Adam Mickiewicz University in Poznan. The subject of his interest are tardigrades (Tardigrada), microscopic invertebrates. His dissertation deals with the ecology and diversity of the tardigrades inhabiting Svalbard. His other research oc-

cupation is the biodiversity of invertebrates and factors affecting their assemblages on glaciers. A laureate of awards, grants and scholarships, including the Diamond Grant of the Ministry of Science and Higher Education and the PRELUDIUM grant of the National Science Centre. Author and co-author of 30 JCR publications.





## POLONEZ 1

NCN Panel:



NZ 8

Call concluded on the

**18th May 2016**

Trace metal effects on wild great tit *Parus*  
major oxidative stress and fitness in  
a gradient of urbanisation

dr Marion Chatelain,

Centre of New Technologies, University of Warsaw



The global land surface covered by cities is expected to triple between 2000 and 2030. Urbanisation is associated with visible environmental change relative to undisturbed habitats, such as the reduction in tree cover and the increase in light and noise levels. It is also associated with “invisible” pollution caused by the increase of chemical pollutants such as trace metals. Nonetheless, cities are also inhabited by plant and animal species, which have great ecological importance and social value. How does urbanisation affect wildlife in cities? Although timely, this question remains largely unanswered.

The great tit *Parus major* and the blue tit *Cyanistes caeruleus* are flagship “wild” animals that are now becoming reference species to study the ecological and evolutionary effects of urbanisation. I am investigating this key research question by working on great and blue tit populations established along a gradient of urbanisation in the city of Warsaw in Poland. 500 nestboxes are studied in a continuum of urban to rural conditions, where tree cover as well as sound, light, chemical pollutant and traffic levels is determined for each nestbox. In particular, I am investigating the link between oxidative stress, a physiological index of organismal health, and urbanisation levels. In the meantime, I am estimating the extent to which trace metal exposure is linked to urbanisation-induced oxidative stress in great and blue tit populations. Because oxidative stress and trace metal exposure are likely to affect great and blue tits in many ways, I am also estimating their impact on great and blue tit health by measuring bird body corpulence, telomere length (telomeres protect the end of a chromosome from deterioration, and their length has been associated with

the rate of ageing in animals), reproductive success and survival. Finally, I am asking whether urbanisation-induced physiological changes identified in this study have a genetic basis. Understanding the nature of these processes (acclimatisation vs. genetic based) is of fundamental interest in evolutionary biology and conservation biology alike. Such knowledge will also be of great value in making accurate forecasts about which animals may settle and prosper in cities.

My research will be carried out as a POLONEZ fellowship in the Centre of New Technologies (CeNT) in Warsaw. I view mobility in science at key stages of a researcher’s career as essential. Integrating into a Polish research institution after spending the majority of my research career in my own country (France) is a welcome exposure to thought, particularly given the innovative research project that has been set up by Dr hab. Marta Szulkin as part of the Wild Urban Evolution and Ecology Lab she is currently leading. Indeed, a key asset of mobility is the possibility of being exposed to new lines of thinking, new theories, concepts and approaches. I am convinced that by carrying out a fellowship based in CeNT at the University of Warsaw and working in close collaboration with Dr Marta Szulkin, I will be able to immerse myself in a new and highly stimulating intellectual environment.

## DR MARION CHATELAIN

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I obtained a Master's degree in Evolutionary Ecology from the National Museum of Natural History of Paris in 2012. I carried out my PhD research on the role of melanin-based plumage colouration in coping with high levels of trace metals in cities at the Institute of Ecology and Environmental Sciences of Paris (Pierre & Marie Curie University; 2012-2015). I further continued as assistant lecturer at Pierre & Marie Curie University where I taught ecology, evolution and statistical methods. I concurrently carried out research on the effects of trace metals on earthworm communities and habitat choice behaviour (2015-2016). In October 2016, I obtained a two-year NCN POLONEZ grant (Marie Skłodowska-Curie COFUND) to work in the Wild Urban Evolution and Ecology Lab on the effects of trace metals on great and blue tit oxidative stress and fitness in a gradient of urbanisation.





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