Research Landscape and Funding opportunities in Germany...in a nutshell

Hanni Geist – Senior Manager, University Relations, DAAD daadsf@daad.org







Research in Germany Land of Ideas



Research in Germany

www.research-in-germany.org

- The Federal Ministry of Education and Research (BMBF) has launched an initiative to "Promote Innovation and Research in Germany" to present Germany's research achievements and opportunities to the international community.
- Under the brand "Research in Germany" several German organizations, such as
 - the Alexander von Humboldt Foundation (AvH),
 - the German Academic Exchange Service (DAAD),
 - the German Research Foundation (DFG),
 - the Fraunhofer-Gesellschaft
 - and the International Bureau of the **BMBF**
- The initiative seeks to strengthen and expand R&D collaboration between Germany and international partners.
 Research in Germany

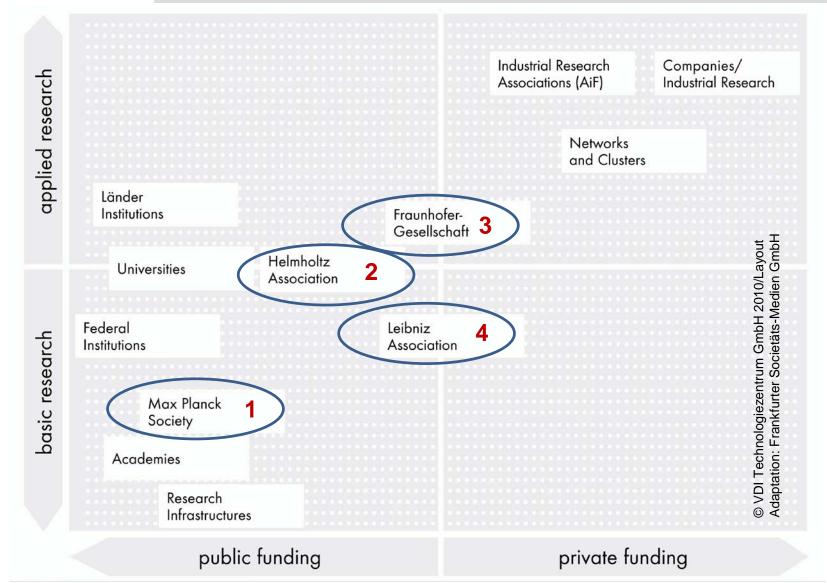


- Top Universities
- Strong in Innovation
- Global Network and Interdisciplinary Research
- Excellent Support and Funding Opportunities
- High Quality of Life





Research Landscape





Facts and Figures



More than 1,000 publicly funded research institutions



Research expenditures 2017: 100 bn Euros = 3.04% GDP

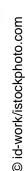
- 69 bn Euros invested by German private sector
- 17.3 bn Euros invested by higher education institutions
- 13.5 bn Euros invested by non-university institutions



658,000 staff in the R&D (401,00 R&D researchers)



Almost 500 research and innovation networks and clusters Approx. 48,500 patent registrations worldwide (5th place)





Internationalization strategy

International cooperation – Networked and innovative

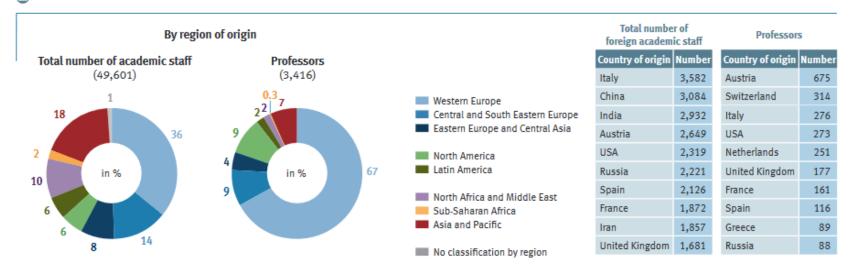
- Strengthening excellence through global cooperation
- Developing Germany's strength in innovation on the international stage
- Internationalizing vocational training and qualification
- Working with emerging and developing countries to shape the global knowledge-based society
- Overcoming global challenges together



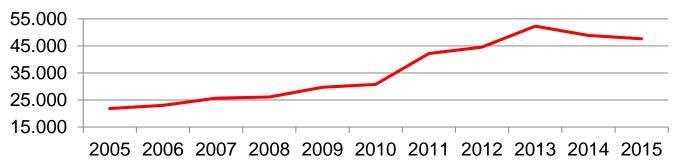


🎥 🌞 International researchers in Germany

24 | Total number of foreign academic staff and foreign professors at German universities, in 2018, by region of origin and key countries of origin, number and in %



Number of international researchers in Germany

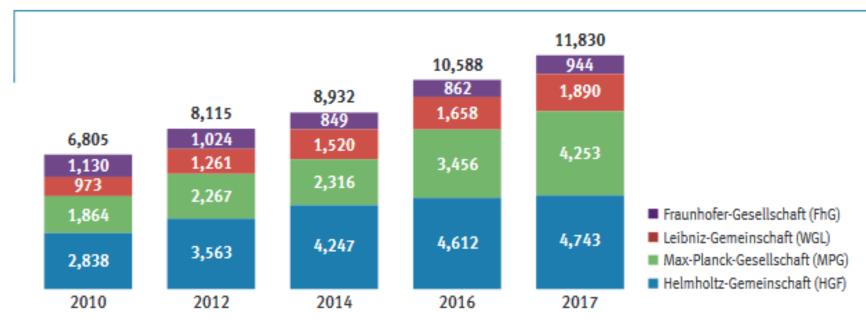




Foreign Staff at Non-University Research Institutes

26 | Foreign academic staff at the four largest German non-university research institutions, since 2010





www.wissenschaft-weltoffen.de/



How can I find a suitable organization, research institution and collaborator?

Cooperation with a German higher education institution

Database contains information on over 33,000 international university partnerships with German higher education institutions: www.internationale-hochschulkooperationen.de/

Publicly funded research projects in Germany

<u>Förderkatalog</u> is a Federal Government database containing details of over 110,000 research projects, the kind of research at laboratories with public funds, info on who is working on which subjects. (In German only)

GERIT – German Research Institutions

<u>GERIT</u> provides a comprehensive overview of approximately 25,000 German research institutions searchable by address, subject area or structural criteria.

Database of DFG-funded research projects

The <u>German Project Information System (GEPRIS)</u> provides information about ongoing and completed research projects funded by the Deutsche Forschungsgemeinschaft (German Research Foundation, DFG), the largest research funding organization and central self-governing organization of the research community in Germany.

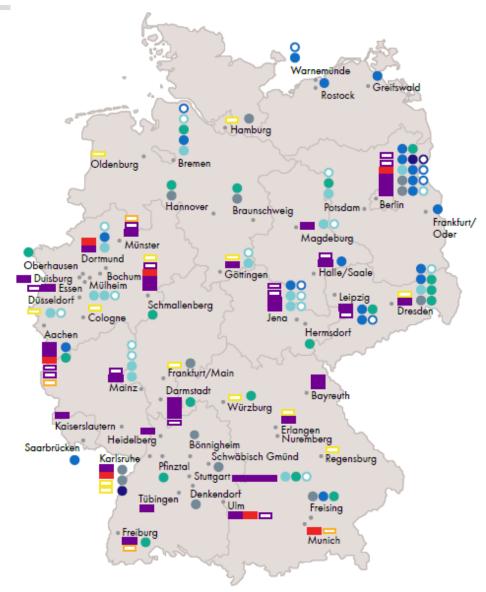
Research in Germany





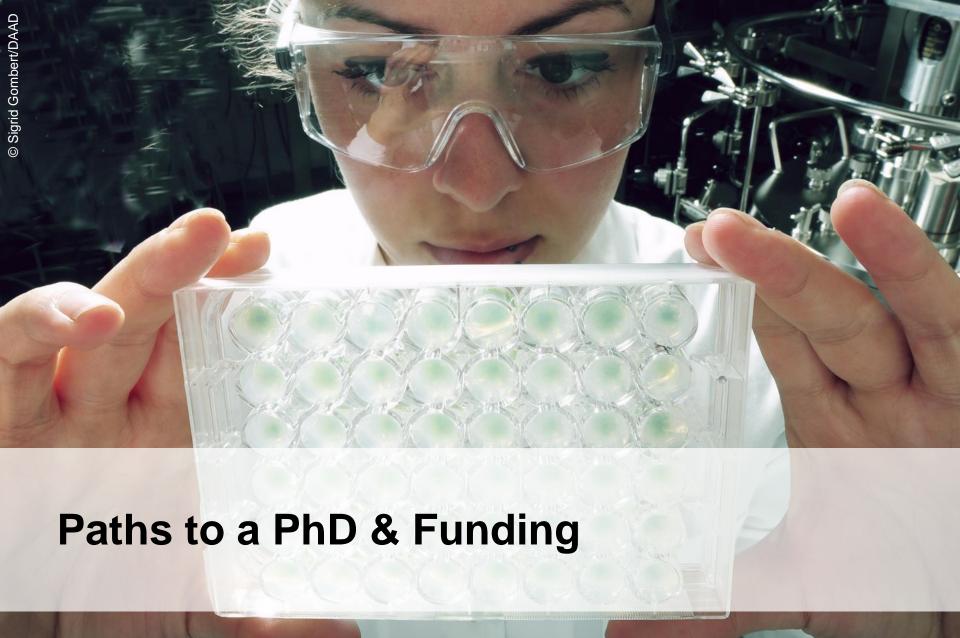
- Research Training Groups
 International Research Training Groups
 Integrated Research Training Groups in
 Collaborative Research Centres/Transregios
 Clusters of Excellence
 Collaborative Research Centres/Transregios
- Helmholtz Graduate Schools
- Leibniz Graduate Schools
- International Max Planck Research Schools
- Fraunhofer Institutes
- Helmholtz Centres
- Leibniz Institutes
- Max Planck Institutes
- Others

DFG funded Priority Programmes and Research Units are not shown on the map since they are not necessarily located at a single location; they are listed on pages 13 and 15.



Research in Germany Source: DAAD 2020

Download PDF here





Paths to a PhD

Individual vs. structured PhD

Individual PhD

- Individual research under supervision of supervisor
- Optional courses or other forms of teaching / learning
- Mostly informal admission and marginal formalisation

Structured PhD

- Guidance by a team of supervisors / supervising committee
- Mandatory, fixed supporting curriculum (interdisciplinary)
- Defined application process
- Offered by research training groups / graduate schools

Download brochure <u>here</u>.





Funding for PhD students

| FUNDING PROGRAMME | DURATION | | TYPE OF FUN | TYPE OF FUNDING | | TYPE OF DOCTORATE | | |
|--|----------------------------------|-----------------------|-----------------------|-------------------|--------------------------------|------------------------------------|--|--|
| | Research stay (up to 2 years) | Complete doctorate | Grant/ scholarship | Work contract* | Individual doctoral project | Structured doc- toral programme | | |
| DLR-DAAD Research Fellowships | | - | | | | | | |
| Green Talents (BMBF) | | | | | | | | |
| Helmholtz Res. Schools & Grad. Schools | | | | - | | | | |
| Indiv. Doctoral Projects at Fraunhofer Institutes | | | | - | | | | |
| Indiv. Doctoral Projects at Leibniz Institutes | | - | | - | | | | |
| Indiv. Doctoral Projects at Max Planck Institutes | | | | - | | | | |
| International Max Planck Research Schools | | | | | | | | |
| Internat. Visiting Researchers at Max Planck Inst. | - | | - | | | | | |
| Leibniz Graduate Schools and ScienceCampi | | | | | | | | |
| Max Planck Schools | | - | - | | | - | | |
| MSC Innovative Training Networks | - | - | | | | | | |
| PhD Fellowships (Boehringer) | | | | | | | | |
| Re-invitation Programme (DAAD) | | | | | | | | |
| Res. Grants - Bi-nationally Superv. Doct. Degrees (DAAD) | | | | | | | | |
| Res. Grants - Doctoral Programmes (DAAD) | | | | | | | | |
| Res. Grants - One-Year and Short-Term (DAAD) | | | | | | | | |
| Research Training Groups (DFG) | | - | | | | | | |
| Support Early Career Res. in Collab. Res. Centres (DFG) | | | | | | | | |

^{*}provided by a university / non-university research institute

Find funding at

https://www.research-in-germany.org/en/research-funding/funding-databases.html

Research in Germany



Funding for Postdocs and Junior Researchers



| FUNDING PROGRAMME | DURATION | | TYPE OF FUNDING | | | CAREER LEVEL | | |
|---|------------------------------|---------------------------------|----------------------|----------------|-----------|----------------------------|---------------------------------|---------------------|
| | Short-term (up to 1 year) | Long-term (more than 1 year) | Fellowship/ grant | Work contract* | Funding** | Postdoctoral researcher | Junior research group leader | Junior professor |
| Bilateral Exchange of Academics (DAAD) | | | - | | | - | | |
| DLR-DAAD Research Fellowships | - | | - | | | - | | |
| Emmy Noether Programme (DFG) | | | | | | | - | |
| ERC Consolidator Grants | | - | | | | | - | |
| ERC Starting Grants | | | | | | | - | |
| ERC Synergy Grants | | | | | | | | |
| Fraunhofer Attract | | | | | | | | |
| Freigeist Fellowships (Volkswagen) | | | | | | | | |
| Georg Forster Research Fellowship (Humboldt) | - | | | | | | | |
| Grants to Support the Initiation of Internat. Collab. (DFG) | - | | | | | | | |
| Green Talents (BMBF) | | | | | | | | |
| Helmholtz Young Investigator Groups | | | | | | | - | |
| Humboldt Research Fellowship | | | | | | | | |
| Internat. Visiting Researchers at Max Planck Inst. | - | | | | | | | |
| Leibniz Junior Research Groups | | | | | | | | |
| Lise Meitner Excellence (Max Planck) | | - | | | | | - | |
| Max Planck Grants for Advanced Postdoct. Training | | | | | | | | |
| Max Planck Research Group Leader | | | | | | | - | |
| MSC European Fellowship | | | | | | | | |
| PRIME (DAAD) | | | | | | | | |
| Re-invitation Programme (DAAD) | | | | | | | | |
| Research Grants (DFG) | | - | | | | | | |
| Research Grants - One-Year and Short-Term (DAAD) | - | | | | | | | |
| Research Stays for Univ. Academics & Scientists (DAAD) | | | - | | | | | |
| Research Training Groups (DFG) | | - | | | | | - | |
| Sofja Kovalevskaja Award (Humboldt) | | - | | | | | | |
| Support Early Career Res. in Collab. Res. Centres (DFG) | | | | | | | | |

^{*} Provided by a university / non-university research institution

Find funding at

https://www.research-in-germany.org/en/researchfunding/funding-databases.html

Research in Germany

^{**}generally includes the researcher's own salary and expenses for staff and consumables



Working as a postdoctoral researcher

- DAAD & DFG research grants
- DLR-DAAD & Leibniz-DAAD research fellowships
- Humboldt research fellowships
- Max Planck grants
- European programme: MSC European Fellowships





Heading a junior research group

- Emmy Noether Programme
- Fraunhofer Attract
- Head of a Max Planck Research Group
- Helmholtz YoungInvestigators Groups
- Sofja Kovalevskaja Award
- European programmes:ERC Starting Grants



For more funding and information, visit www.research-in-germany.org/funding-programmes



Junior professorship

- Support for early career researchers within DFGfunded
 - Collaborative Research Centres
 - Clusters of Excellence







| FUNDING PROGRAMME | DURATION | | TYPE OF FUNDING | | | CAREER LEVEL | | |
|---|------------------------------|---------------------------------|----------------------|----------------|-----------|------------------------|--------------------------|-----------|
| | Short-term (up to 1 year) | Long-term (more than 1 year) | Fellowship/ award | Work contract* | Funding** | Experienced researcher | Research group leader | Professor |
| Alexander von Humboldt Professorship | | - | | | | | - | |
| Bilateral Exchange of Academics (DAAD) | | | | | | | | |
| DLR-DAAD Research Fellowships | - | | | | | | | |
| ERC Advanced Grants | | - | | | | | | |
| ERC Synergy Grants | | | | | | | | |
| First Appointment Women Scientists (Helmholtz) | | | | | | | | |
| Fraunhofer Attract | | - | | | | | - | |
| Fraunhofer-Bessel Research Award (Humboldt) | - | | | | | - | | |
| Friedrich Wilhelm Bessel Research Award (Humboldt) | - | | | | | | | |
| Georg Forster Research Award (Humboldt) | | | | | | | | |
| Georg Forster Research Fellowship (Humboldt) | | | | | | | | |
| Grants to Support the Initiation of Internat. Collab. (DFG) | | | | | | | | |
| Heisenberg Programme (DFG) | | | | | | | | |
| Humboldt Research Award | | | | | | | | |
| Humboldt Research Fellowship | | | | | | | | |
| Internat. Visiting Researchers at Max Planck Inst. | - | | | | | | | |
| Internat. Visiting Scholars at Leibniz Institutes | | | | | | | | |
| Leibniz Programme for Women Professors | | - | | | | | | |
| Lichtenberg Endowed Professorships (Volkswagen) | | | | | | | | |
| MSC European Fellowship | | - | | | | | | |
| Re-invitation Programme (DAAD) | | | | | | | | |
| Research Grants (DFG) | | - | | | | | | |
| Research Stays for Univ. Academics & Scientists (DAAD) | - | | - | | | | | |
| Top-Level International Women Scientists (Helmholtz) | | | | | | | | |

* Provided by a university / non-university research institution **generally includes the researcher's own salary and expenses for staff and consumables

Find funding at

https://www.research-in-germany.org/en/research-funding/funding-databases.html



Working as an experienced researcher

- Research Awards:
 - Fraunhofer-Bessel
 - Humboldt
 - **–** ...
- Visiting researchers at Max Planck/Leibniz Institutes
- European programmes:
 ERC Advanced Grants, MSC
 European Fellowships





Heading a research group

- Alexander von Humboldt Professorship
- Fraunhofer Attract





Professorship

Professorship within the Heisenberg Programme





Research in Germany:

www.research-in-germany.org/funding

 Research in Germany – Publications for download:

<u>www.research-in-</u> <u>germany.org/en/infoservice/publications.html</u>

DAAD funding database:

www.funding-guide.de

EURAXESS Germany funding database

www.euraxess.de

European funding programs www.kowi.eu













Thank you!



Hanni Geist

DAAD Information Point San Francisco

daadsf@daad.org

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Murthy Gudipati, NASA JPL

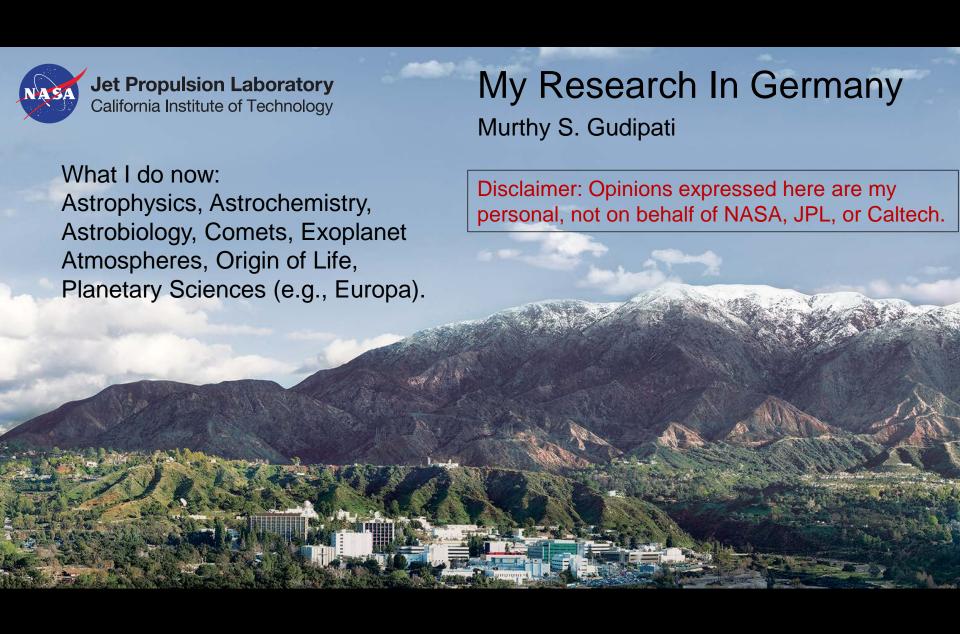




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My Research Journey

Ph.D. – Physical Organic Chemistry
Postdoc – Low-Temperature Chemistry
R.A. & Habilitation - Low-Temperature Physics

NASA ARC – Low-Temperature Astrochemistry NASA JPL/Caltech – Planetary Sciences



My Research In Germany

Institut für Physikalische Chemie, Universität zu Köln (Cologne, Germany)

DFG Habilitation Fellow

- Excellent Infrastructure
- Well Trained Students
- Funding Resources (DFG/BMBF)
- Opportunities at Central Facilities (such as BESSY, Berlin)
- Focus on Science
- International Recognition (Gordon Research Conferences)
- Habilitation
- Move to NASA, California.



Why Should You Consider Research in Germany

Science, Arts, and Music – Bring People Together and Build Bridges Across Nations!

- Different Perspective How to Conduct Research
- Excellent Infrastructure –
 Enabling Focused Research
- Establishing Collaborations –
 That Last Lifetime
- Funding Resources
 (DFG/BMBF) Germany Invests
 Significantly In R&D!

- Cultural Enrichment
- Historic Places in Science
- Germany is the Center of Europe
- International Friendships That Last Lifetime
- Learning Languages
- Quality of Life/Vacation!

When is the right time? Earlier the better Bachelors, Masters, Ph.D., Postdoc.









Any questions? Use the Q&A function now!

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Marc Prosenc, TU Kaiserslautern





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Collaborative Research Initiative CRC 88 3MET

Dr. Marc Prosenc

















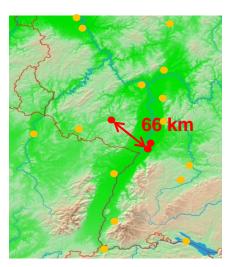






3MET – Locations







"People are united by their common idea of research"

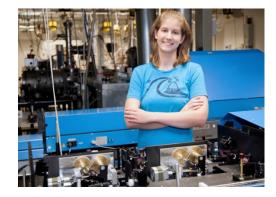
Synthesis – Catalysis – Magnetism – Gas Phase Chemistry – Spectroscopy - Theory



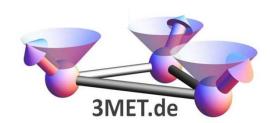


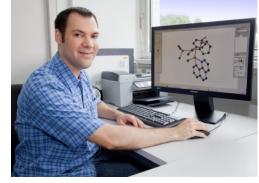
3MET – People











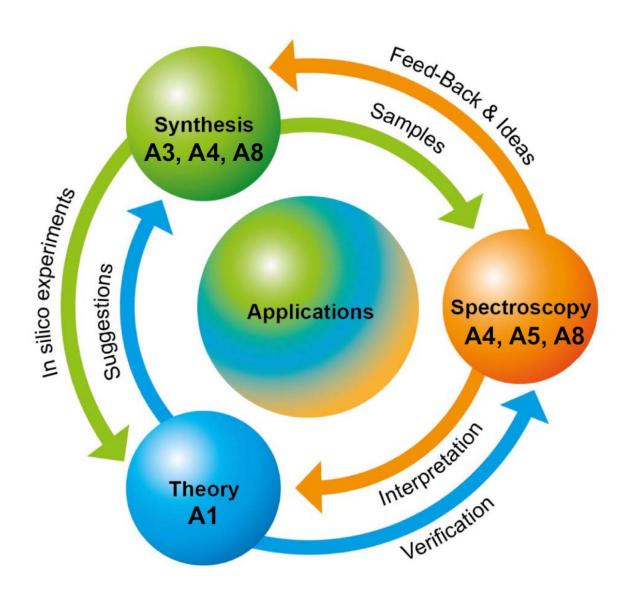




...in an excellent research environment!

Research in Germany



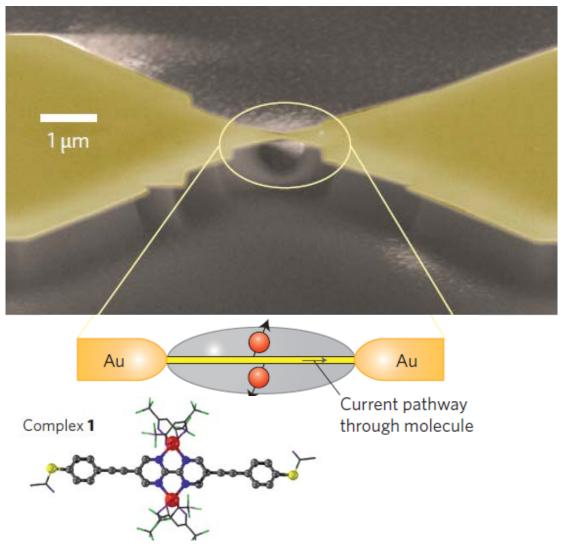


Research in German



3MET - Nanotechnology

(Spin dependant transport through molecules)



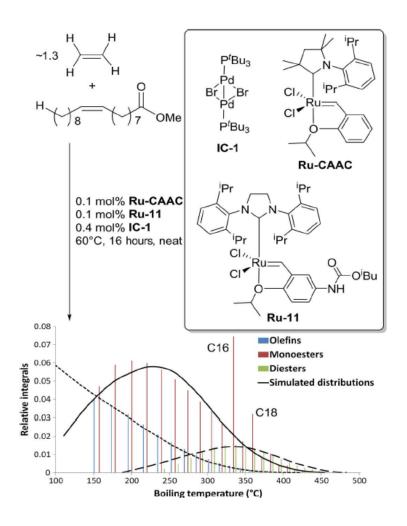
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K. Fink, M. Ruben et al. Nature Nano. 2013, 8, 575-579.



3MET - Catalysis

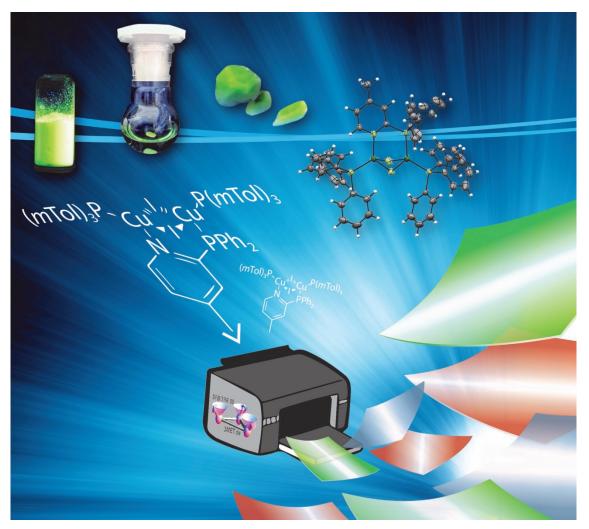
(Biofuel by conversion of natural products)



K. F. Pfister, S. Baader, M. Baader, S. Berndt, L. J. Gooßen *Sci. Adv.* **2017**, e1602624.



3MET – Optical Properties



Bräse et al. Chem. Eur. J. 2016, 22,16400 -16405.

Research in Germany 40



We hire



Postdocs

PhD Students



Technische Universität Kaiserslautern Excellent Research & Teaching



DEPARTMENTS

- Architecture
- Biology
- Business and Economics
- Chemistry
- Civil Engineering
- Computer Science
- Electrical & Computer Engineering
- Mathematics
- Mechanical & Process Engineering
- Physics
- Social Sciences
- Spatial & Environmental Planning

WHAT SETS US APART?

- research-oriented university with focus on technology and natural sciences
- well proven combination of fundamental and applied research
- favorable student-teacher ratio
- excellent network of renowned research institutes based around our campus
- international focus in research and teaching



SNAPSHOT 2019

13,733 students enrolled

2,673 international students

109 study courses

216 professorships

1,437 academic & scientific staff

Research in Germany 42



Technische Universität Kaiserslautern Excellence in Research

INTERDISCIPLINARY RESEARCH

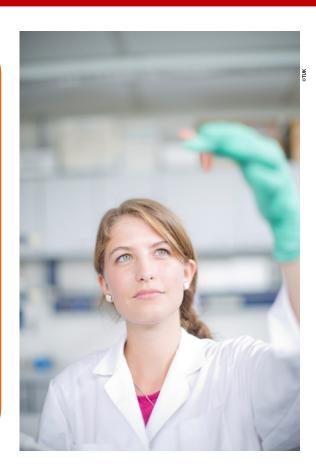
6 DFG-funded Special Research Areas

2 International DFG-funded Research Training Groups

4 Research Projects funded by the European Research Council (ERC)

Numerous research collaborations with renowned research institutes close to our campus such as:

- Fraunhofer Institute for Industrial Mathematics
- Fraunhofer Institute for Experimental Software Engineering
- German Research Center for Artificial Intelligence
- Max Planck Institute for Software Systems



RESEARCH FOCUS

six key research fields:

- Light-Matter-Spin Interactions Quantum Phenomena, Model Systems and Technologies
- Membrane and Systems Biology, Bio-Analytics
- Resource Efficiency and Sustainable Development
- High-Performance Materials and Constructions, Production Technology
- Mathematical Modelling, Algorithms and Simulation
- Digitalization of Economy and Society

*DFG: Deutsche Forschungsgemeinschaft (German Research Foundation)

Research in Germany 43









Any questions? Use the Q&A function now!







Sergi Garcia-Segura, Arizona State University











Research experiences in Germany

Sergi Garcia-Segura, Ph.D.

Assistant Professor Arizona State University

School of Sustainable Engineering and the Built Environment



Background

B.Sc. Chemistry Ph.D. Chemistry



B.Sc. Material Science Engineering



UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

M.Sc. Electrochemistry



Universitat d'Alacant Universidad de Alicante





Background









Background

Scientific impact

96 publications40 h-indexOver 4669 citations

International Awards

2020 ISE-Elsevier Prize of Applied

Electrochemistry

2018 'Jóvenes Investigadores' Award from the

Electrochemistry group of the Spanish Royal

Society of Chemistry

2017 Electrochimica Acta travel award

2016 Antonio Aldaz award

2015 Green Talent award

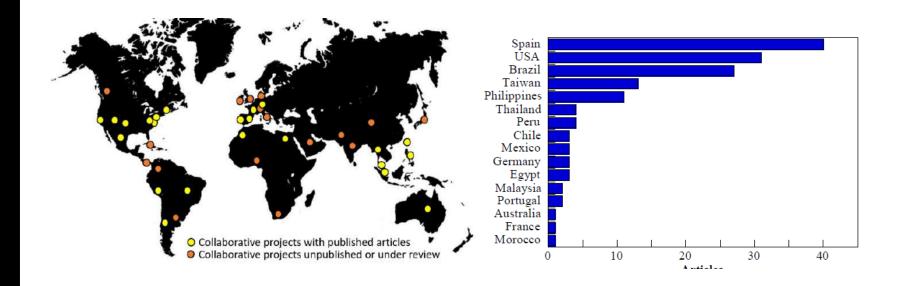
2014 ISE Prize of Environmental Electrochem.



Research philosophy

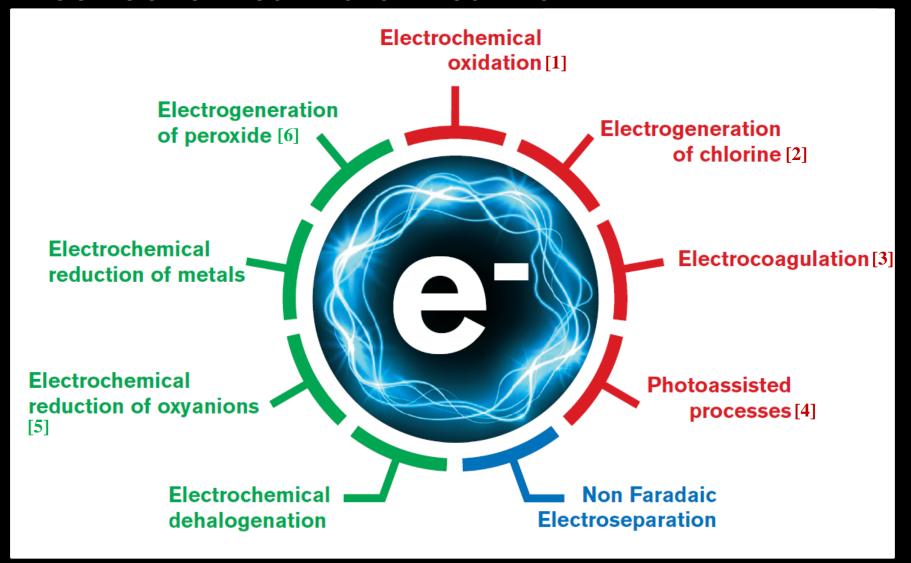
- Fundamental research
- Applied research
- Innovation
- Collaborative research
- Personal growth
- Critical thinking
- Outreach

International Network



International perspective is required to design local or sitespecific research within the context of critical global-scale questions in sustainability science, where electrochemistry will play an important role.

Electrochemical water treatment



- [1] S. Garcia-Segura, J.D. Ocon, M.N. Chong, Process Safe. Environ. 113 (2017) 48-67. most cited article in this journal
- [2] E. Mostafa, P. Reinsberg, S. Garcia-Segura, H. Baltruschat, *Electrochim. Acta* 281 (2018) 831-840.
- [3] S. Garcia-Segura, M.M.S.G. Eiband, J.V. de Melo, C.A. Martínez-Huitle, *J. Electroanal. Chem.* 801 (2017) 267-299. most cited article in this journal
- [4] S. Garcia-Segura, E. Brillas, J. Photochem. Photobiol. C 31 (2017) 1-35. most cited article in this journal
- [5] S. Garcia-Segura, M. Lanzarini-Lopes, K. Hristovski, P. Westerhoff, Appl. Catal. B: Environ. 236 (2018) 546-568

German ecosystem as innovation platform





German ecosystem as innovation platform







German ecosystem as innovation platform

Applied Catalysis B: Environmental 207 (2017) 376-384



Contents lists available at ScienceDirect Applied Catalysis B: Environmental

journal homepage: www.elsevier.com/locate/apcatb



CrossMark

2017 55 citations

Could NO_x be released during mineralization of pollutants containing nitrogen by hydroxyl radical? Ascertaining the release of N-volatile species



Institute of Physical and Theoretical Chemistry, University of Bonn, D-53117 Bonn, Germany

Electrochimica Acta 281 (2018) 831-840



Contents lists available at ScienceDirect

Electrochimica Acta

journal homepage: www.elsevier.com/locate/electacta



Chlorine species evolution during electrochlorination on boron-doped diamond anodes: In-situ electrogeneration of Cl₂, Cl₂O and ClO₂



Ehab Mostafa a, b, Philip Reinsberg a, Sergi Garcia-Segura a, c, a, Helmut Baltruschat a, a

- a Institute of Physical and Theoretical Chemistry, University of Bonn, D-53117, Bonn, Germany
- b Chemistry Department, Faculty of Science, Mansoura University, 35516, Mansoura, Egypt
- Sanosystems Engineering Research Center for Nanotechnology-Enabled Water Treatment, School of Sustainable Engineering and the Built Environment,

Arizona State University, Tempe, AZ, 85287-3005, USA

Water Research 160 (2019) 107-117



Contents lists available at ScienceDirect

Water Research





journal homepage: www.elsevier.com/locate/watres

Electrogeneration of inorganic chloramines on boron-doped diamond anodes during electrochemical oxidation of ammonium chloride, urea and synthetic urine matrix



Sergi Garcia-Segura a, **, 1, Ehab Mostafa a, b, Helmut Baltruschat a, *

2018 56 citations

2019 20 citations

b Chemistry Department, Faculty of Science, Mansoura University, 35516 Mansoura, Egypt

^a Institute of Physical and Theoretical Chemistry, University of Bonn, D-53117 Bonn, Germany

Chemistry Department, Faculty of Science, Mansoura University, 35516 Mansoura, Egypt

Questions ?



Sergi Garcia-Segura sgarcias@asu.edu



Funding acknowledgment:































Any questions? Use the Q&A function now!







Chris Ober,
Cornell University

















Any questions? Use the Q&A function now!







Thank you!





Want to know more?

Chat with us at our virtual booth #1217

AN INITIATIVE OF THE



We would greatly appreciate your feedback: https://ges-portal.eu/acs2020-visitors.aspx

