

Researcher Training and Funding Opportunities for African Students

Prof Dr Carsten P Welsch





Overview

- What makes an *ideal training*? What skills do you have/need?
- How to find your dream *job*? What are your options?
- How to apply for *funding*?



My background



- Beam Diagnostics 2008 - 2012
 - **21 Fellows**, 32 partners www.liv.ac.uk/ditanet



- Laser Applications 2011 - 2015
 - **19 Fellows**, 38 Partners www.la3net.eu



- Accelerator Optimization 2011 - 2015
 - **23 Fellows**, 35 Partners www.opac-project.eu

MSCA Networks



- Medical Applications 2016 - 2020
 - **15 Fellows**, 33 Partners www.oma-project.eu



- Antimatter R&D 2017 - 2021
 - **16 Fellows**, 35 Partners www.ava-project.eu



- EuPRAXIA-DN *since 2023*
 - **12 Fellows**, 23 Partners www.eupraxia-dn.org

Centre for Doctoral Training



- Data Intensive Science 2017 - *present*
 - **~80 PhD students**, 2 universities + industry
 - www.livdat.org and www.livinno.org





Personal background

- **Coordinator** of six MSCA research networks across life sciences, physics and engineering, overseeing training of ~100 Marie Curie Fellows
- **Director** of two Centers for Doctoral Training in Data Intensive Science with ~40 PhD students per center
- **Head of Physics Department** (2016 – 2023), responsible for training of 200 staff, +150 PhD students, plus 100s of undergraduates
- Chair of **STFC's Education Training and Careers Committee** and member of **UKRI's Skills Advisory Group** (2021 – 2023), shaping researcher development in UK
- Member of **STFC Council** (since 2023), contributing to strategic research and skills planning across all areas of STFC research.

European Competence Framework





Example: What does an Academic do ?

Research

- **Driver:** Blue sky and/or applied research;
- **Freedom:** Choice of research topics;
- **Two worlds:** Research and teaching;

Teaching

- **undergraduate:** lectures, workshops, tutorials;
- **postgraduate:** research projects, advanced lectures, schools, workshops

Administration

- **Own projects** (budget, equipment, reports, PR, IPR, etc.)
- Self, students, researchers, group, institute, department, school, faculty, etc.



Hugely diverse skills set needed

- Academic/teaching skills
- Project leadership
- Team leadership
- Grant writing
- Budget management
- Time management
- Presentation skills
- Outreach (media interaction, event organization, etc.)
- Industry-relevant skills (*IPR, patent law, commercialization strategies, market overview, etc.*)



*Eierlegende Wollmilchsau
~Egg-laying-wool-milk-pig*



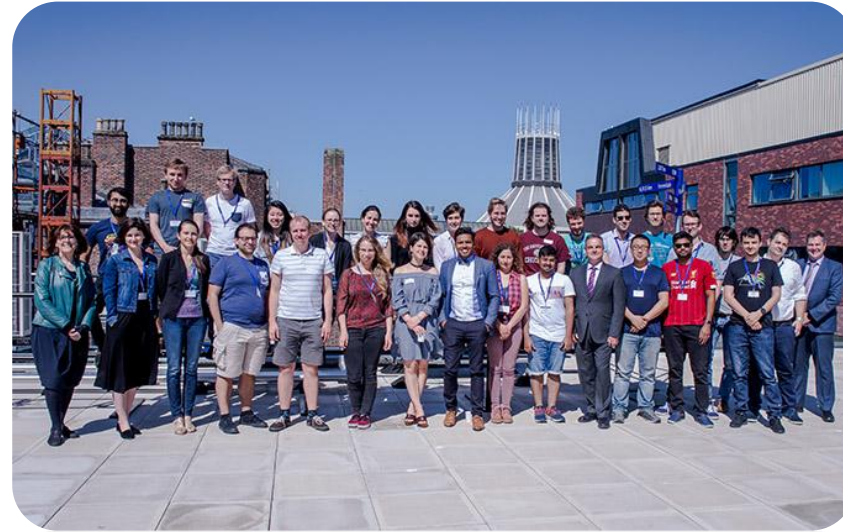
How to get to the best “you”?

- Major challenge: We live in one of the most dynamic times where the required skills for researchers are changing at record speed.
- **Key skills** now required are not even mentioned in any of the major competence frameworks, e.g. digital literacy, prompt engineering, opportunities and challenges related to tools such as ChatGPT, looking after each other.
- **Consortia** are powerful way to go beyond standard training framework and benefit from unique expertise and capabilities.
- **Role of industry?** We need to re-think researcher training...in particular the opportunities from placements, e.g. LIV.INNO.



Researcher Training

- Cohort-based training usually provides a **better experience**.

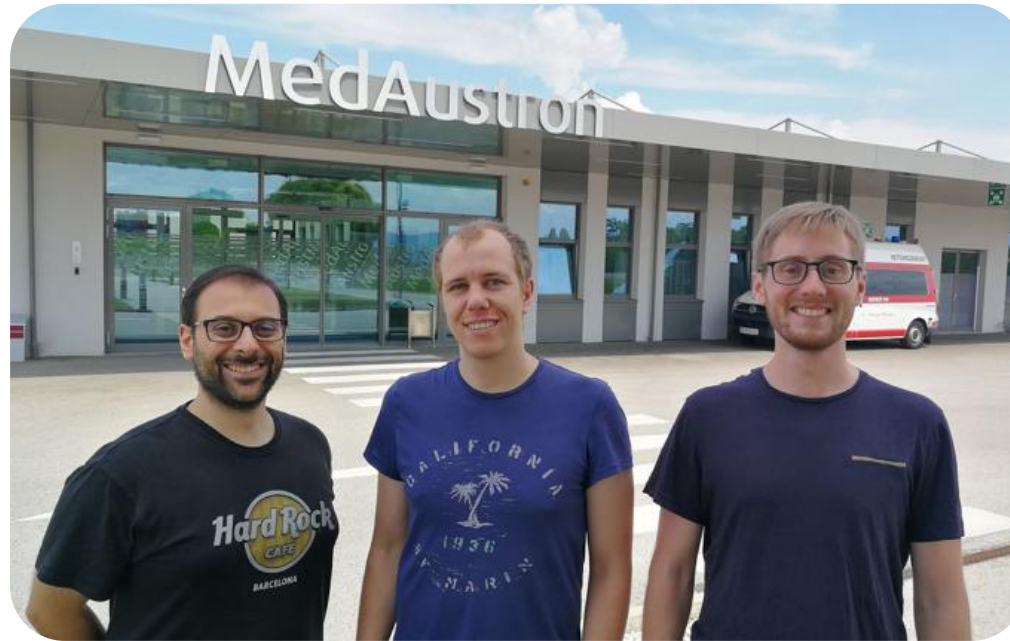


- **Employability aspects are more attractive** for businesses as they get access to larger pool of Fellows – *and vice versa*.
- Close links allow to identify best practice and share experiences.



Researcher Training

Fellows get insight into other cutting-edge research areas in many countries and sectors; an excellent opportunity to make contacts – and identify future job opportunities



Case study: Miha Cerv (center) held Fellowship in AVA, now working on medical accelerators (OMA); links were created through joint events.



How-to Guide: Academic Career Path

- Cutting edge research;
- Demonstrated R&D leadership (*publications, invited talks, etc.*);
- Establish international collaboration network;
- Attract funding;
- Be lucky with the timing.



What are the challenges in Academia ?

- **Career planning:** Work contracts;
- **Time constraints:** there is never enough time !
- **Be the best...**in everything (R&D, impact, teaching, communication and outreach, etc.) – one of most stressful jobs with constant high pressure
- **Support I:** Institutional support (?) services;
- **Support II:** Funding !!



EURAXESS UK offers guidance and resources for researchers moving to or from the UK.

It is part of the wider **EURAXESS network**, established by the European Commission to help support researchers' mobility between countries and career development.

All EURAXESS services are free to access

The British Council represents EURAXESS for the UK, funded by Department for Science, Innovation and Technology

www.euraxess.org.uk





Explore EURAXESS

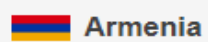


The EURAXESS network includes
43 European countries

Explore EURAXESS National Portals



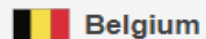
Albania



Armenia



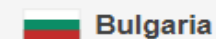
Austria



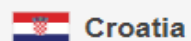
Belgium



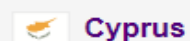
Bosnia and Herzegovina



Bulgaria



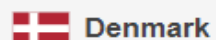
Croatia



Cyprus



Czech Republic



Denmark



Estonia



Faroe Islands



Finland



France




Georgia




 **Germany**

 **Greece**

 **Hungary**

 **Iceland**


 **Ireland**

 **Israel**

 **Italy**

 **Latvia**

 **Lithuania**


 **Luxembourg**


 **Malta**

 **Moldova**

 **Montenegro**


 **Netherlands**

 **North Macedonia**


 **Norway**

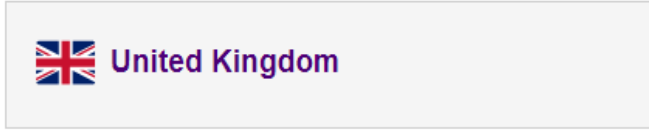
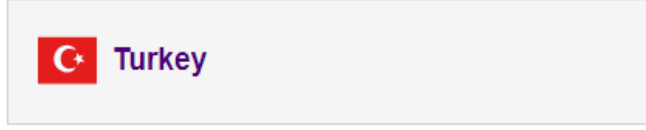
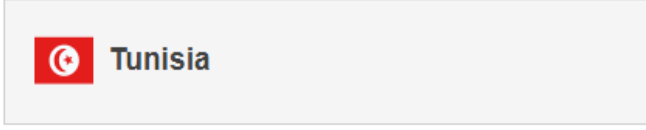
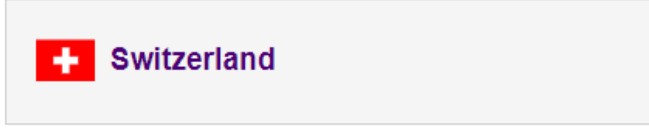
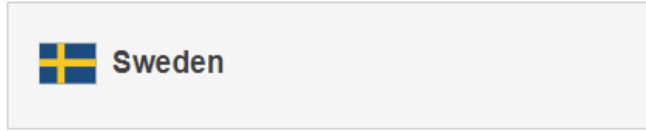
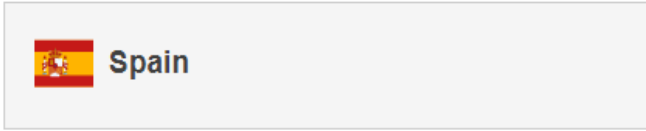
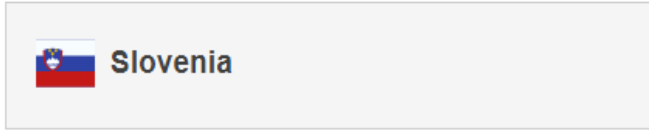
 **Poland**

 **Portugal**

 **Romania**

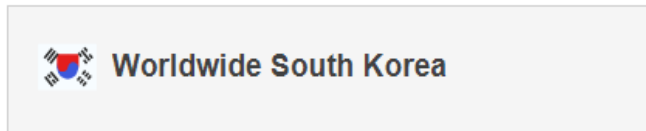
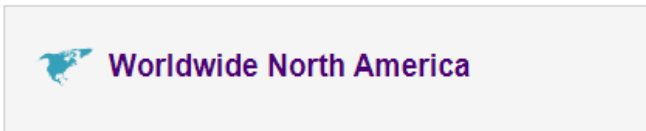
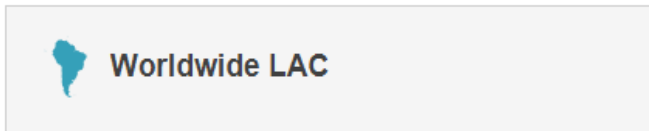
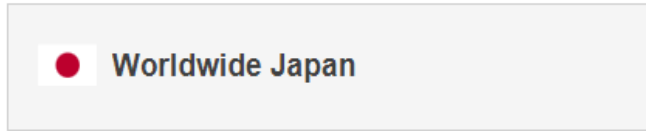
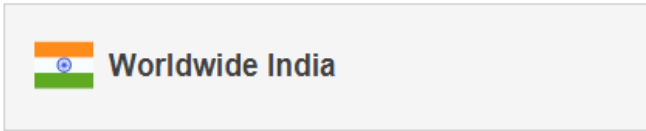
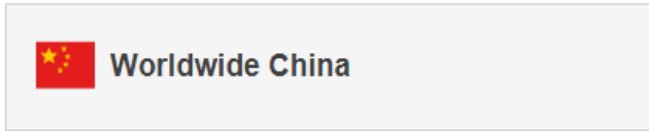
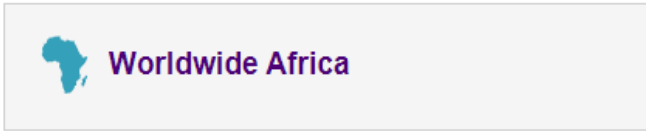
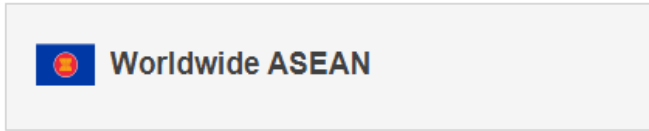
 **Serbia**

 **Slovakia**



The EURAXESS network also includes
9 worldwide hubs

Explore EURAXESS Worldwide





13/11/2024

SWITZERLAND

TÜRKIYE

UNITED KINGDOM

WORLDWIDE

ASEAN

AFRICA

ALBANIA

THERE ARE CURRENTLY

8041

JOB OFFERS

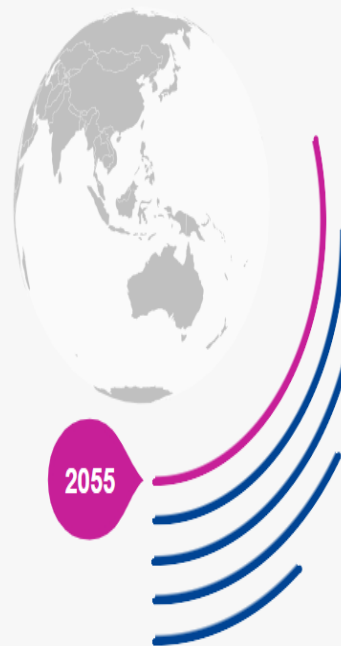
[FIND JOBS >](#)

THERE ARE CURRENTLY

654

EURAXESS CENTRES

[FIND PERSONALISED ASSISTANCE >](#)



THESE TOP 5 RESEARCH FIELDS ARE CURRENTLY TRENDING WITHIN THE NETWORK

— ENGINEERING

PHYSICS

BIOLOGICAL SCIENCES

CHEMISTRY

COMPUTER SCIENCE



Researchers

Main draw:

- Job search
- Funding search
- Hosting search

Also available:

- Country Advice
- Career Development

100000+
researchers
using the
platform

64000+ job
offers
published
yearly
(average)

Research Institutions

Main draw:

- Job offer
- Funding offer
- Hosting offer

Also available:

- Resources for institution
- Resources for researchers

13000+
registered
organisations



A lot of essential information on the portal

Daily life

Entry conditions and visas

Accommodation

Healthcare

Personal finance

Research landscape

Family

Social welfare rights

Recognition of qualifications

Who to notify

Taxation

Where else can I go?

Intellectual Property Rights (IPR)

Career Development



Example: UK funding overview

Where to gain funding

There are many different ways to gain funding for your research in the UK. There are specialised councils operating in the UK that offer grants and fellowships. As well as Europe wide initiatives offering opportunities in various scientific fields. Plus some international opportunities.

FUNDING IN THE UK

UKRI and Research Councils

Learned Societies and Academies

Charitable organisations

Professional bodies

Northern Ireland, Scotland and Wales

UKRI and Research Councils

UK Research and Innovation (UKRI) is the national funding agency investing in science and research in the UK. UKRI brings together the seven disciplinary research councils. Plus, Research England, which is responsible for supporting research and knowledge exchange at higher education institutions in England, and the UK's innovation agency, Innovate UK. The Research Councils are the main public investors in fundamental research in the UK, with interests ranging from arts and humanities to particle physics.

UKRI provide funding to:

- researchers
- businesses
- universities, NHS bodies, charities, non-governmental organisations (NGOs) and other institutions.

+ UK RESEARCH AND INNOVATION (UKRI)

+ ARTS & HUMANITIES RESEARCH COUNCIL (AHRC)

+ BIOTECHNOLOGY & BIOLOGICAL SCIENCES RESEARCH COUNCIL (BBSRC)

+ ECONOMIC & SOCIAL RESEARCH COUNCIL (ESRC)

Example: UK Contact Information



EuraxessUK@britishcouncil.org



www.euraxess.org.uk



<https://www.facebook.com/EuraxessUK>



<https://twitter.com/EuraxessUK>



[linkedin.com/company/euraxess-uk](https://www.linkedin.com/company/euraxess-uk)



<https://www.euraxess.org.uk/united-kingdom/uk-network/stay-up-to-date>





There are MANY funding opportunities

- **MSCA**: Doctoral Networks and Individual Fellowships
- **Erasmus Mundus**
- **COST Action** for workshops and meetings, knowledge transfer
- National and bi/multi-literal graduate schools and centers for doctoral training

And much, much more.... Today: Focus on **Horizon Europe**.

Overview



Horizon Europe (2021-2027) — 95,52 Mrd.



Pillar I
Excellent Science — 25,01 Mrd.

European Research Council (ERC) — 16,00 Mrd.

Marie Skłodowska-Curie Actions (MSCA) — 6,60 Mrd.

Research Infrastructures — 2,41 Mrd.



Pillar II
Global Challenges & Industrial Competitiveness — 53,52 Mrd.

Thematic clusters

1. Health — 8,25 Mrd.
 2. Culture, Creativity and inclusive Society — 2,28 Mrd.
 3. Civil Security for Society — 1,60 Mrd.
 4. Digital, Industry and Space — 15,35 Mrd.
 5. Climate, Energy and Mobility — 15,12 Mrd.
 6. Food, Bioeconomy, Natural Resources, Agriculture & Environment — 8,95 Mrd.
- Non-nuclear direct actions of the Joint Research Centre (JRC) — 1,97 Mrd.



Pillar III
Innovative Europe — 13,60 Mrd.

European Innovation Council (EIC) — 10,11 Mrd.

European Innovation Ecosystems (EIE) — 0,53 Mrd.

European Institute of Innovation and Technology (EIT) — 2,97 Mrd.

Widening participation and strengthening the European Research Area — 3,39 Mrd.

Widening Participation and Spreading Excellence — 2,96 Mrd.

Reforming and Enhancing the European R&I System — 0,44 Mrd.

KOWi
Kooperationsstelle EU der
Wissenschaftsorganisationen



What are the MSCA in a nutshell?

- Fund excellent frontier research and breakthrough scientific ideas
- Equip researchers with new knowledge and skills through mobility and exposure to different sectors and discipline



Marie Skłodowska-Curie Actions – Aims



Strengthening the European Research Area (ERA)

- Encouraging people to embark on research careers in Europe
- Foster excellence through implementation of research project

Enhancing mobility and collaboration

- International
- Interdisciplinary
- Inter-sectoral

Promoting the researchers' career development

- Providing training for key competences in science and industry (training on research & transferable skills) -> employability
- Creating fair and attractive working conditions

MSCA



Pillar I Excellent Science

European Research Council (ERC)

Marie Skłodowska-Curie
Actions (MSCA)

Research Infrastructures

- **Doctoral Networks**
- Postdoctoral Fellowships
- Staff Exchanges
- Co-funding of regional, national and international programmes (COFUND)
- MSCA and Citizens



MSCA Doctoral Networks - advantages

- Funded PhD positions for up to 3 years
- All domains of research are covered (bottom-up approach)
- Topic of the PhD project already defined: You can start very soon
- Employment contract including social security benefits
- 100% working time on your project
- Training within an international network
- Contact to the non-academic sector and potential future employers



Conditions for taking part

- You apply for vacancies in EU-funded DN projects: Euraxess Job Portal
- You do not hold a PhD
- You can be of any nationality and age
- You need to follow the MSCA Mobility Rule



Interdisciplinary R&D

- MSCA networks are often part of something much bigger.
- For example, the **EuPRAXIA MSCA Doctoral Network** is closely connected with:
 - **EuPRAXIA Design Study** (Horizon 2020)
 - **EuPRAXIA Preparatory Phase** (Horizon Europe Infra)
 - **EuPRAXIA facility** (ESFRI roadmap, national and international funding)
 - **EuAPS** (Nationally funded, Italy)
 - **PACRI** project (Horizon Europe)
 - and more...

Doctoral Networks are stimulating collaboration and ideal to pave the way for follow-on projects.

Remember: EURAXESS Job Portal



EURAXESS
Researchers in motion

Home Jobs & Opportunities Living & Working in Europe Career Development Initiatives Network ERA Talent Platform

You are here: Home > Jobs and opportunities > Search Jobs and Opportunities

Search Jobs and Opportunities

Take advantage of EURAXESS and find your job, funding or hosting opportunity. Browse through thousands of vacancies and fellowships from Europe and around the world.

Filter by

Offer Type
Job Offer

Country
Germany

Research Field
Select

Researcher Profile
First Stage Researcher (R)

Sector
Select

Positions
PhD Positions

Funding Programme
Horizon Europe - MSCA

Offer Category
Select

Apply filters Clear filters

Search results (17) Showing results 1 to 10

Germany Horizon Europe - MSCA First Stage Researcher (R) Job Offer PhD Positions

Hide Filters Simple view Sort results

JOB GERMANY

Fraunhofer HHI | Posted on: 11 September 2024

Fully funded PhD project under Horizon Europe MSCA Doctoral Networks "FOCAL": Architecture design and effective routing for optical multi-layered space/aerial networks

This fully funded PhD position is available under the recently launched Horizon Europe Marie Skłodowska-Curie Action (MSCA) Doctoral Networks (DN) project "FOCAL" (Free-space Optical Communications for Aerial-satellite networks). PhD position title: Architecture design and effective routing for...

Department: Photonic Networks and Systems

Work Locations: Number of offers: 1, Germany Fraunhofer Heinrich-Hertz Institute, Berlin

Research Field: Engineering > Electrical engineering
Engineering > Communication engineering
Technology > Telecommunications technology

Researcher Profile: First Stage Researcher (R1)

Funding Programme: Horizon Europe - MSCA

Application Deadline: 30 Sep 2024 - 23:59 (Europe/Berlin)

Share

JOB GERMANY

Ruhr University Bochum | Posted on: 10 September 2024

PhD position within FLUXIONIC, a Marie Skłodowska-Curie Doctoral Network on simulations of nanoscale water confinement and transport

The Chair of Theoretical physics of electrified liquid-solid interfaces at the Faculty of Physics and Astronomy is looking for a PhD (m/f), for 3 years, 39.83 hours per week, TVL E13 Nanoscale water confinement and transport occur in a range of natural phenomena (e.g. ion channels, lubrication) and...



MSCA



Pillar I Excellent Science

European Research Council (ERC)

Marie Skłodowska-Curie
Actions (MSCA)

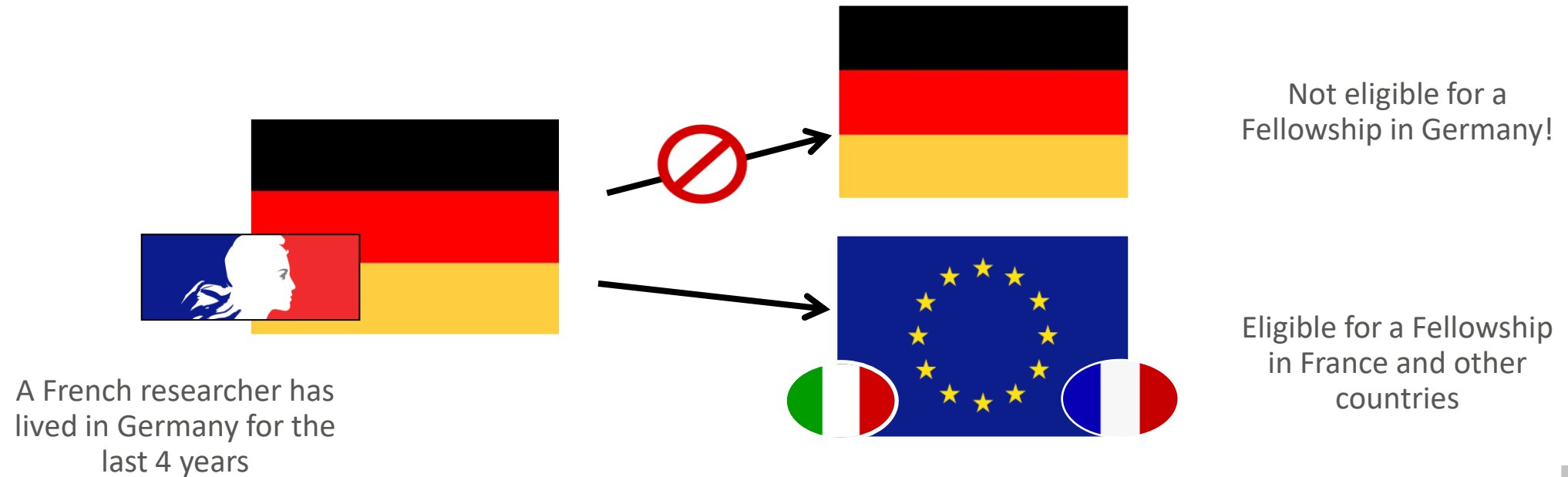
Research Infrastructures

- Doctoral Networks
- **Postdoctoral Fellowships**
- Staff Exchanges
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- MSCA and Citizens



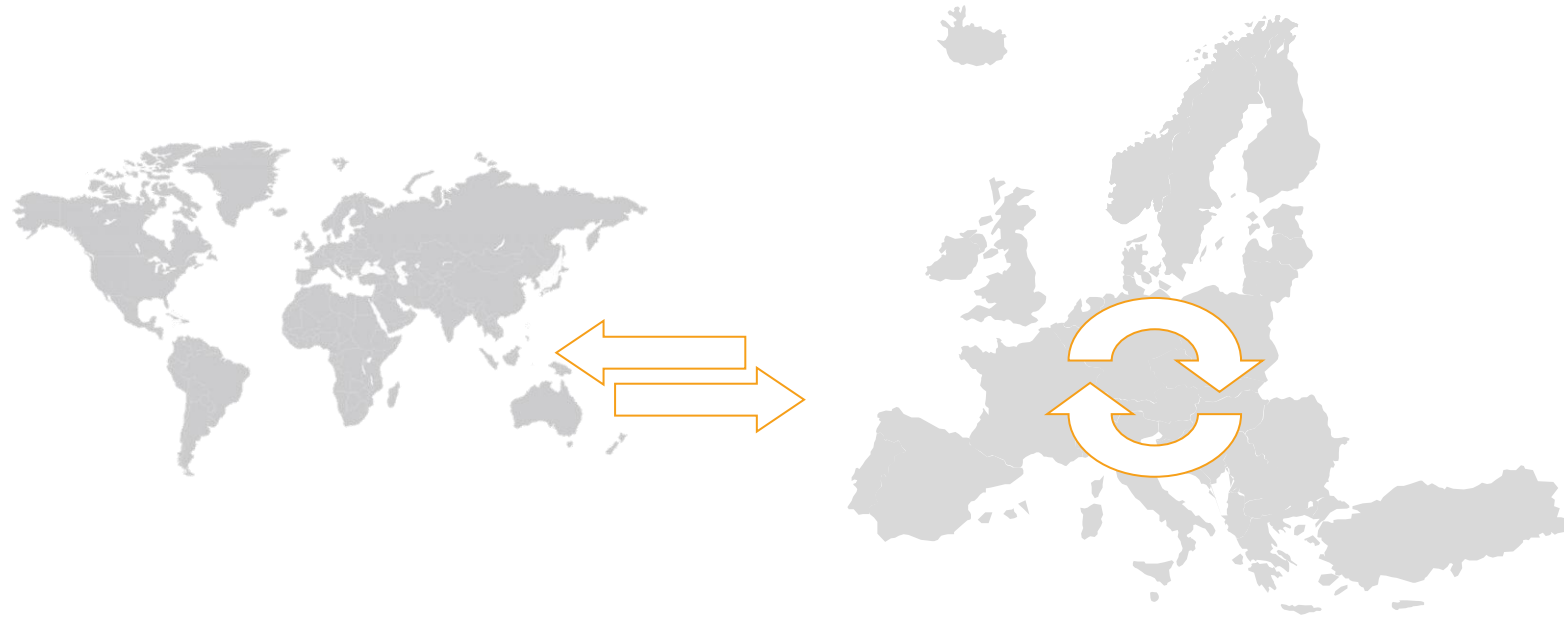
MSCA - mobility rule

Fellow has lived or worked ≤ 12 months within the last 3 years
in the potential host country





Global and European Fellowships



Global Postdoctoral Fellowships

European Postdoctoral Fellowships



European Postdoctoral Fellowship

Eligible

Postdoctoral researchers with ≤ 8 years* of full-time postdoctoral research experience, no nationality restriction
for resubmissions: application must have reached the quality threshold of 70%

Mobility Rule: Stay in the host country not longer than 12 months within the last 3 years

Project duration: 1-2 years (placement optional: +6 months in the non-academic sector in Europe)

Secondment phase: Optionally worldwide for max. 1/3 of the project duration

Procedure and contents of the Fellowship:

- Fellow writes individual application jointly with Host Institution
- Research & skill training at Host Institution

*Departing from periods outside research and career breaks as well as periods in a TC
(only applies to citizens of an EU MS or AC, or "long-term residents").



Global Postdoctoral Fellowship

Eligible

Postdocs with ≤ 8 years* of research experience after PhD (full-time)

for resubmission: proposal must have reached the quality threshold of 70%

Researchers Nationality: MS / AC or at least 5 years of residence in MS /AC ("long-term residents")

Mobility Rule: Stay in the host country not longer than 12 months within the last 3 years

Project duration: 1-2 years in TC (outgoing phase) + 1 year obligatory return phase in MS /AC (placement optional: +6 months in non-academic sector in Europe)

Secondment phase: Optionally worldwide for max. 1/3 of the outgoing phase

Procedure and contents of the Fellowship:

- Fellow writes individual application jointly with Host Institution
- Research & skill training at Host Institution

*Departing from periods outside research and career breaks as well as periods in a TC (only applies to citizens of an EU MS or AC, or "long-term residents").

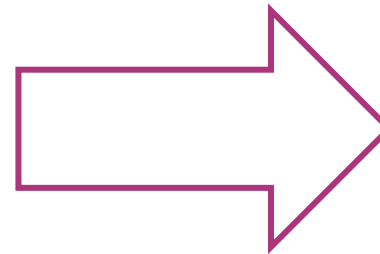
MSCA Call 2025



Action	Call opening	Deadline
Postdoctoral Fellowships	09 April 2025	10 September 2025



There is much more...



„Furthermore, there is evidence that former MSCA fellows tend to be more successful when applying for ERC grants“

Quote from the Horizon 2020 Ex-Post-Evaluation, January 2024

ERC Funding Schemes



Pillar I
Excellent Science

European Research Council (ERC)

Marie Skłodowska-Curie
Actions (MSCA)

Research Infrastructures

- **Starting Grants**
2-7 years after PhD
- Consolidator Grants
7-12 years after PhD
- Advanced Grants
10 years track record
- Synergy Grants
Teams with 2-4 PIs
- Proof of Concept
- Preparing ideas from ERC
Grants for the market



ERC Underlying Principles

- European funding of basic research („frontier research“)
- Development of funding schemes is science-driven (Scientific Council)
- Open to all fields of research: bottom-up, investigator-driven, annual calls for proposal
- Open for researchers of any age and nationality

Scientific excellence is the sole criterion for evaluation!



ERC Funding Modalities

- Funding of individuals: Principal Investigator (PI) + project
- Support for researchers to start or consolidate their own independent research team in Europe (MS or AC)

Funding: 100 % + 25 %

- **All direct project costs:** salary of PI and project team (partly/full), travel expenses, consumables, publication costs (incl. Open Access), research-related costs, equipment costs (within the limits of depreciation rules), subcontracts
- Additional financing of indirect costs: 25 % overhead

Example: ERC Starting Grants – Overview



Target group

- 2 - 7 years after PhD defence (extensions possible in exceptional cases; special rules for MD)

Funding

- Max. EUR 1.5 million for max. 5 years (all direct project costs, e.g. salary of PI and team members)

Exception: + EUR 1 million for major equipment, major fieldworks/ experimental costs or for PIs from Third Countries

Host institution

- In EU Member State or Associated Country

Time commitment

- $\geq 50\%$ ($\geq 50\%$ in Europe)

Procedure

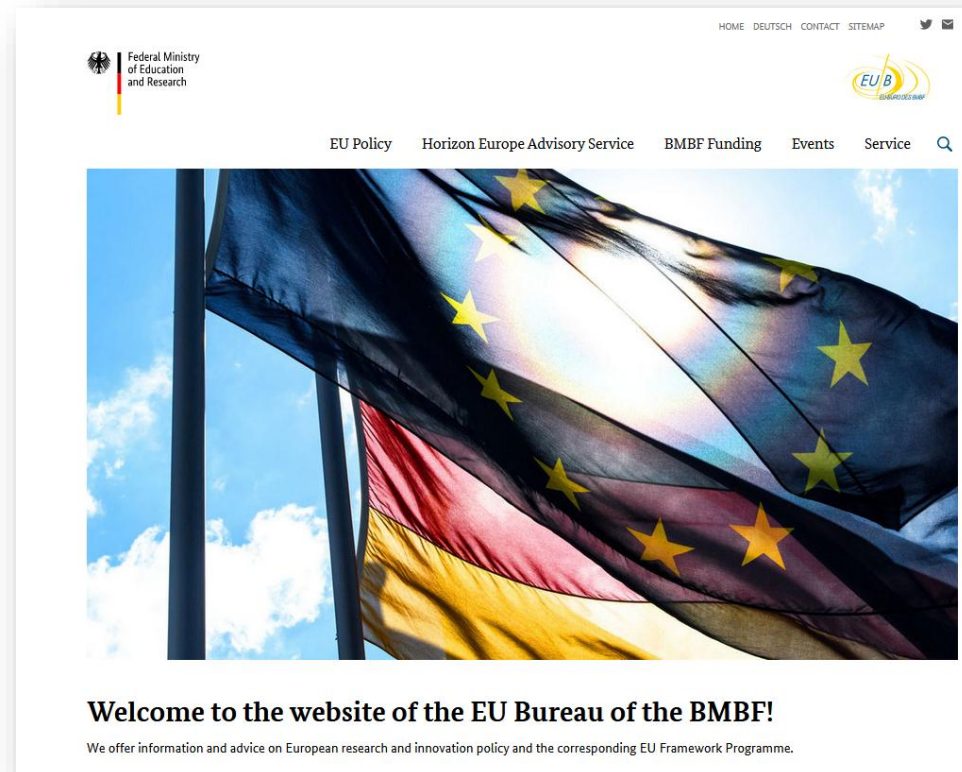
- Single submission of full proposal, two-step evaluation (incl. Interview)
- Yearly Call

ERC Work Programme 2025 – dates

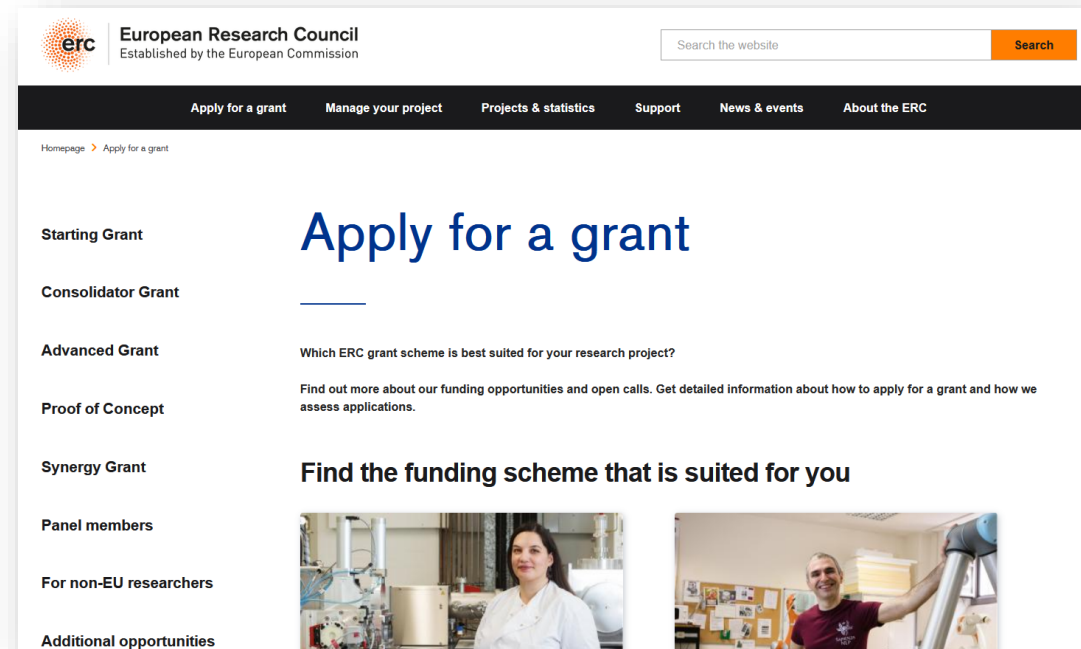


Funding scheme	Call-opening	Call-Deadline	Budget (Mio. EUR)	Estimated number of grants
Starting Grants	10 July 2024	15 October 2024	751	483
Consolidator Grants	26 September 2024	14 January 2025	719	354
Advanced Grants	22 May 2025	28 August 2025	683	276
Synergy Grants	11 July 2024	06 November 2024	500	48

ERC Information online



National Contact Point ERC (NCP ERC):
<https://www.euburo.de/en/index.html>



• **ERC Website:**
<https://erc.europa.eu/>

AFRICA INITIATIVE II - HORIZON EUROPE strengthens EU-Africa cooperation in Research & Innovation



Africa Initiative II

In the 2nd Work Programme of Horizon Europe 2023-2024

- Building on the positive outcome of the Africa Initiative I of Horizon Europe Work Programme 2021-2022.
- A total budget of ~300 MEUR through ~30 topics under calls for proposals to boost EU-Africa cooperation on Research & Innovation (R&I).

<https://euraxess.ec.europa.eu/worldwide/africa/news/africa-initiative-ii-horizon-europe-strengthens-eu-africa-cooperation>



MSCA-NET: Matchmaker

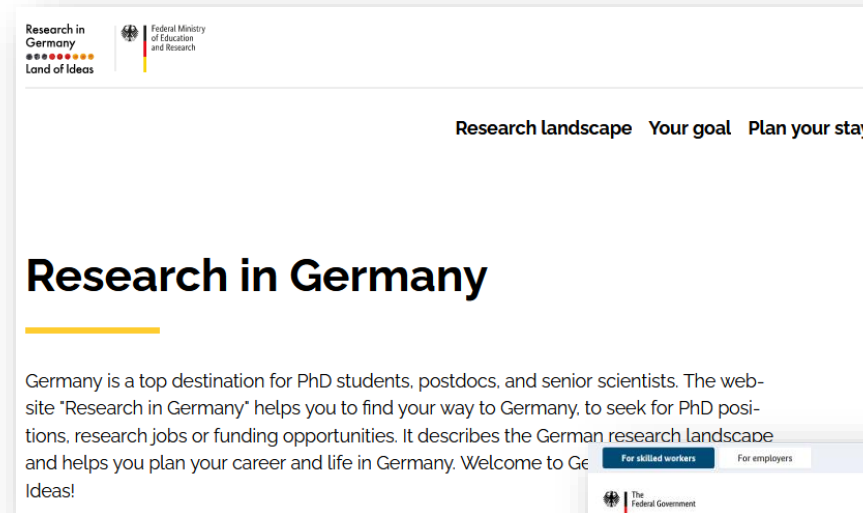
The screenshot shows the MSCA-NET website homepage. At the top left, there is a banner with five stylized human profiles in different colors. To the right of this banner is a blue circle with the word "RENEWAL" in red and "MAY 2025" in white below it. Further right, the text "MSCA matchmaking platform" is displayed in white on a dark grey background. Below the banner, the text "MSCA-NET" is followed by a blue circle and the text "THE MARIE SKŁODOWSKA-CURIE ACTIONS MATCHMAKING PLATFORM". A navigation menu includes links for "Info", "How it works", "PF call", "DN call", "SE call", "COFUND call", "MSCA and Citizens", "Widening opportunities", "FAQ", and "Contact". The "PF call" link is underlined. The main content area features the heading "Objective of Postdoctoral Fellowships" and a paragraph explaining the purpose of these fellowships. To the right of this text is a blue button labeled "Register now" with the subtext "Open until 1 May 2025". Below this, the text "ORGANISED BY" is followed by the MSCA-NET logo. Further down are logos for "enterprise europe network" (with the European Union flag), "fundación para el conocimiento madrid", and "NCP WIDERA.NET". At the bottom left of the main content area is a photograph of a plant specimen with a magnifying glass over a cluster of green, spherical structures. To the right of the website screenshot is a large QR code.



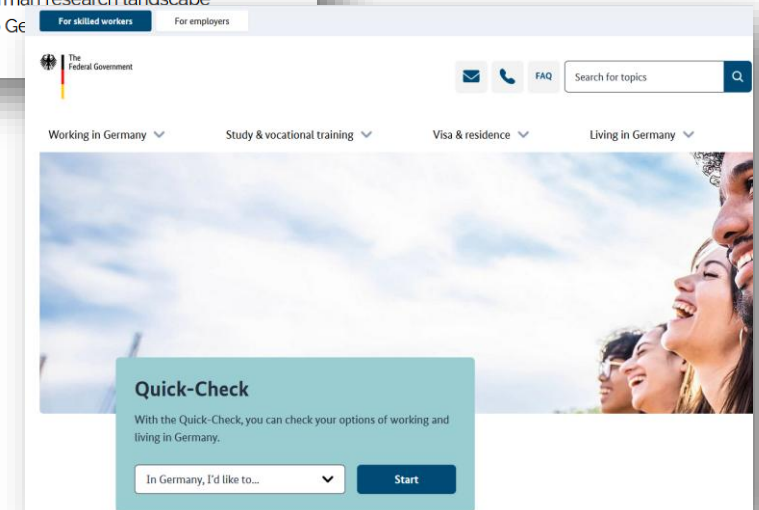


Opportunities for researchers in Germany

- Research in Germany: search for PhD positions & funding opportunities in Germany



- Make it in Germany: official website for qualified professionals





Finally: A word on applications

- Make sure you focus on the particular post – generic applications are unlikely to be successful.
- There is a lot of competition!
- Spend time and effort on your application, clearly explain your motivation – why you?
- Use tools such as ChatGPT or Google Gemini to ensure English is to a good standard, **BUT** do not let these tools write your applications!!!



Summary

- To become the best researcher you can be, you need to do a critical self-assessment
- Get one (or several) **mentors** – critical friends that follow your journey
- **International experience** broadens skills and improves employability.
- **Interdisciplinary training events** support knowledge transfer and pave the way for collaborative R&D.
- Attracting your **own funding** gives independence – and paves the way for a successful career as a research leader.

Good luck!



Many thanks

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