

# PRISMAS- Recruitment day

PhD Research and Innovation in Synchrotron  
Methods and Applications in Sweden

ONLINE-WEBINAR  
Lund, 24 March 2023



# Introduction / Key players

## Programme Director



Dr. Marjolein Thunnissen

Life Science Director @ MAX IV

## Director of Studies



Dr. Lindsay Richard Merte

Associate Professor  
Malmö University

## Project Coordinators



Judith Maichle



Dr. Doriana Orbanic

User Office @ MAX IV

# Today's topics

- ▲ Introduction of MAX IV Laboratory
- ▲ The PRISMAS Programme
- ▲ Conducting a PhD in Sweden
- ▲ The PRISMAS Training activities
- ▲ How to join the PRISMAS Programme
- ▲ Q&A

Questions?

Please add them in the  
Q&A module of this  
webinar

# Introduction of MAX IV

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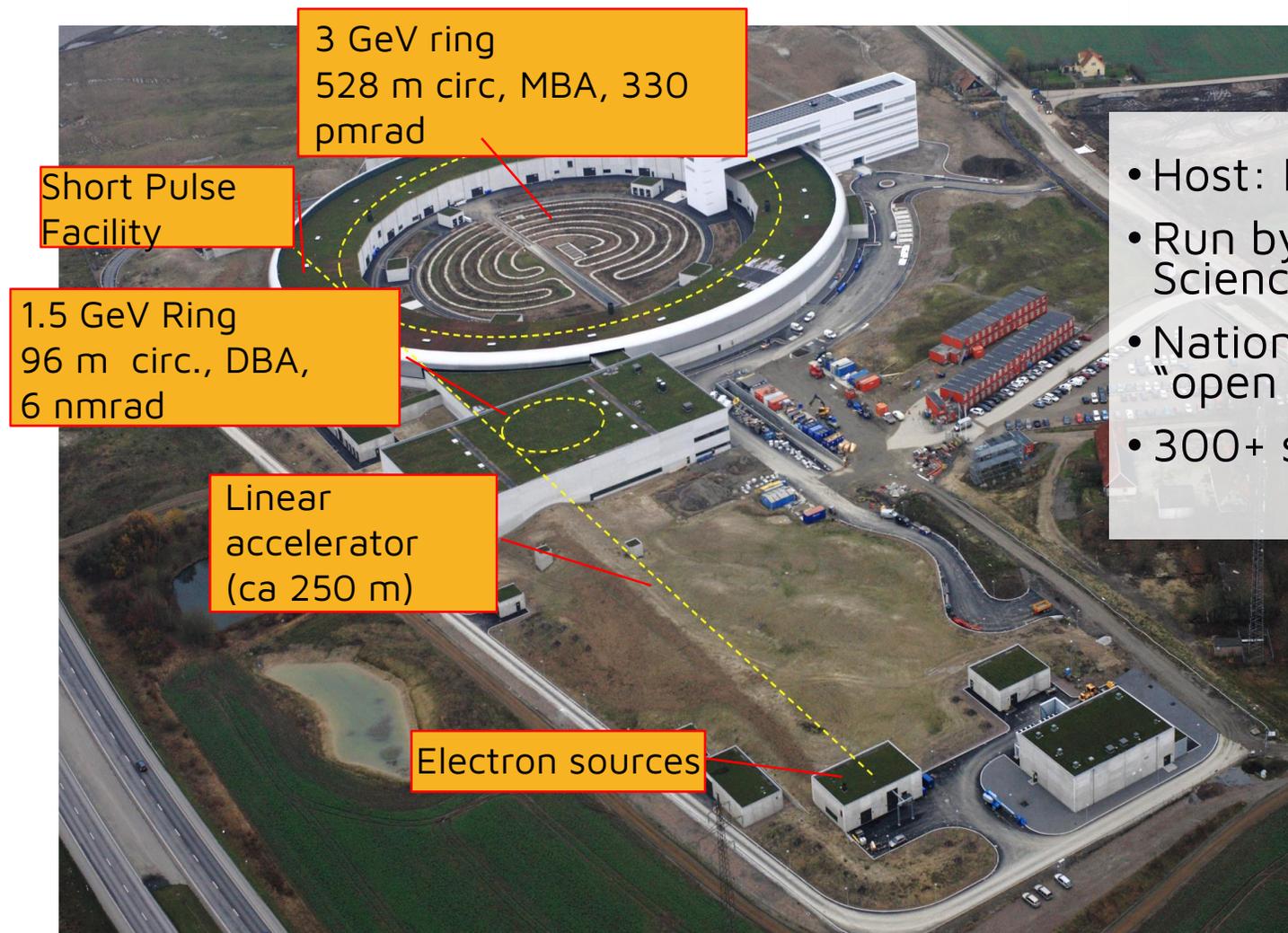


# What is MAX IV

- A national research infrastructure (Synchrotron) in Lund, southern Sweden.
- A facility open to researchers from Sweden, Scandinavia/the Baltic Region and the whole world.
- Currently about 1500 users/year
- A successor to a long tradition of accelerator design and development in Lund.
- First diffraction limited light-source.



# MAX IV Laboratory - overview



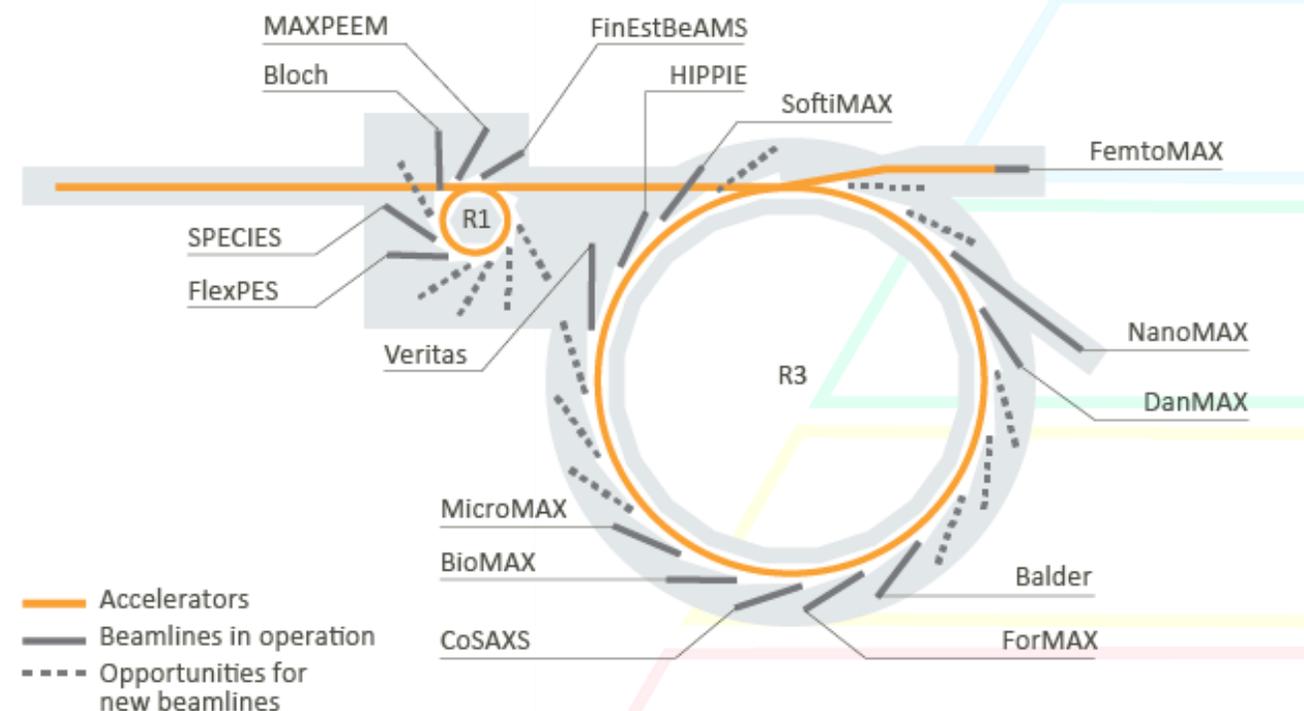
- Host: Lund University
- Run by: LU & National Science Council (VR)
- National laboratory – “open access”
- 300+ staff members

# MAX IV Laboratory – in numbers

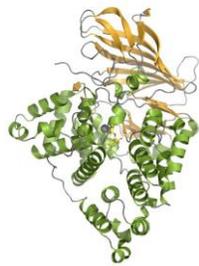
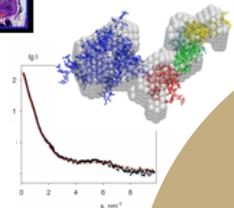
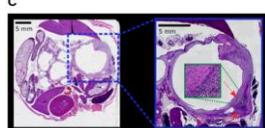
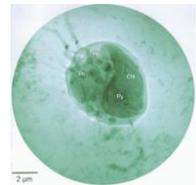
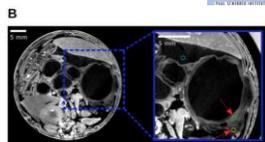
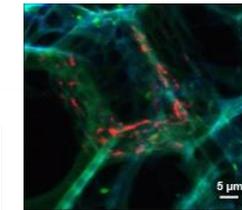
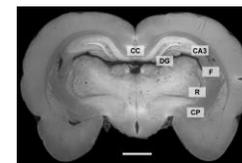
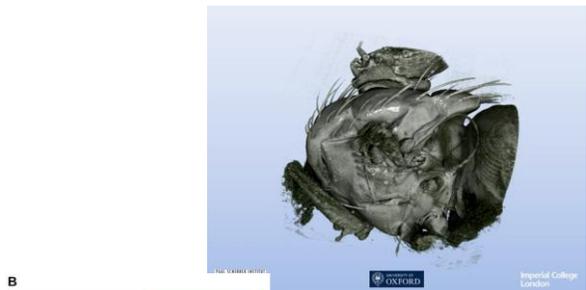
- Inauguration date: June 21, 2016
- 2 Rings: 3GeV, 1,5GeV
- Number of employees: 300+
- Researchers per year: 1000-3000
- 16 Beamlines in operation

- Techniques
  - Imaging
  - Diffraction and Scattering
  - Spectroscopy

## ❖ Accelerator Science



Micro to Nanostructures



Scattering & Diffraction

Imaging

Spectroscopy

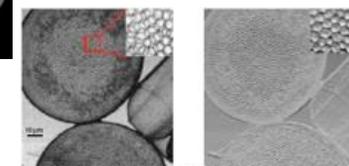
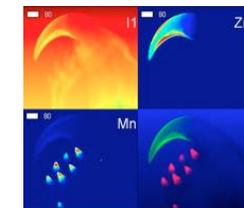
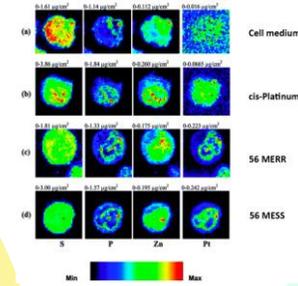
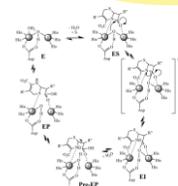
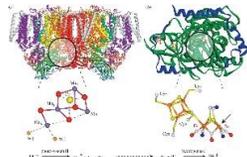


Figure 1. Native junctional domain "Compendium 30", bound to an anionically patterned polystyrene shell of amorphous latex particles. The stream of the latex particle shell consisting of a double hexagonal lattice are observed. The bright spot image (left) and the diffraction phase contrast image (right) are acquired simultaneously. Phase range: 7.14 2π. (Downloaded from pmc.ncbi.nlm.nih.gov)

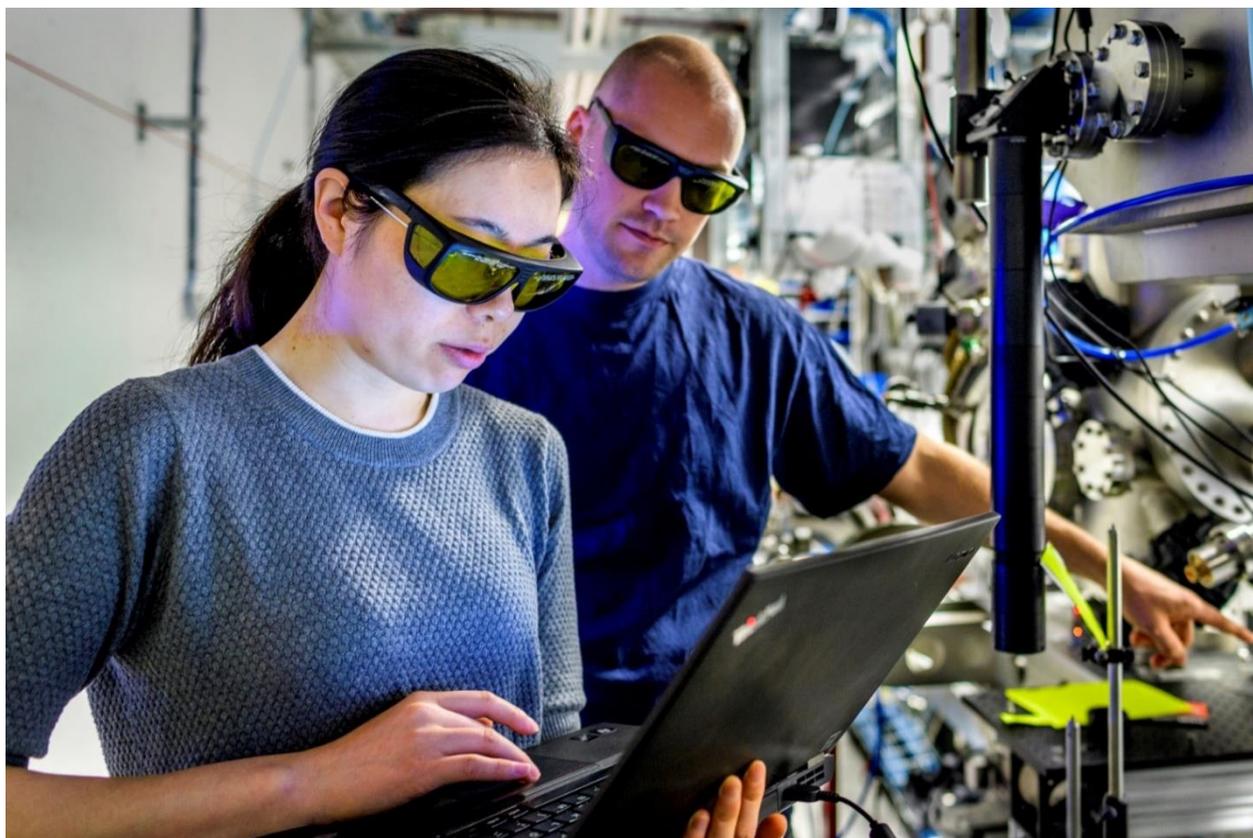


Atomic structure

Electronic structure



# Your secondment @ MAX IV



As temporary staff @ MAX IV you will:

- Gain expertise in key synchrotron-based technologies
- Be involved in experiments at a beamline
- Develop your project with tools on the forefront of science
- Be integrated in the MAX IV community
- Have the opportunity to enable life-long lasting personal networks

# The PRISMAS Programme

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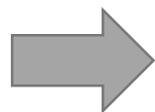


# Programme overview

- PRISMAS – PhD Research and Innovation in Synchrotron Methods and Applications in Sweden  
(Grant agreement ID: 101081419)



- MSCA COFUND: <https://marie-sklodowska-curie-actions.ec.europa.eu/actions/cofund>

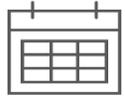


**FOCUS ON TRAINING !**

# PRISMAS in numbers



40 Doctoral students



1 January 2023 – 31 December 2027



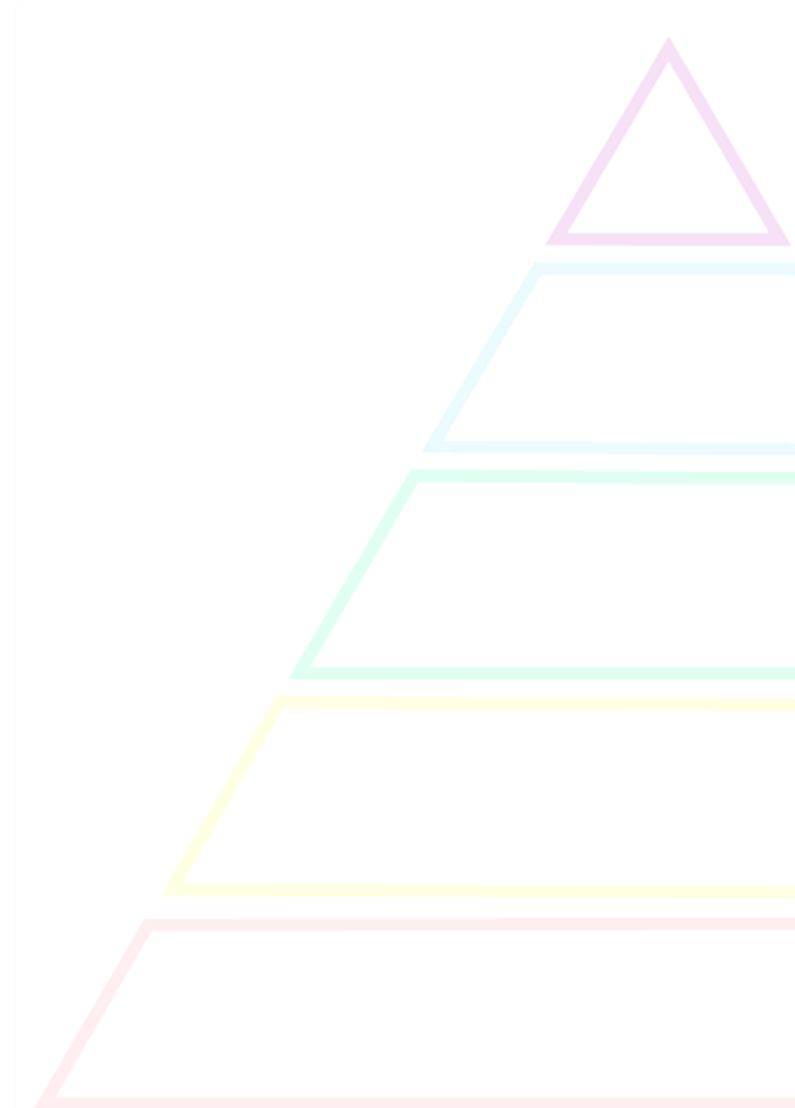
Coordinator: MAX IV Laboratory



Implementing partners:  
9 Swedish Universities



Total budget: €15,7M  
EU-Contribution: 33%  
Consortium: 67%



# Consortium

Lund University

Karlstad University (KAU)

Royal Institute of Technology in Stockholm (KTH)

Luleå University of Technology (LTU)

Malmö University (MAU)

Swedish University of Agricultural Sciences (SLU)

Stockholm University (SU)

Umeå University (UMU)

Uppsala University (UU)



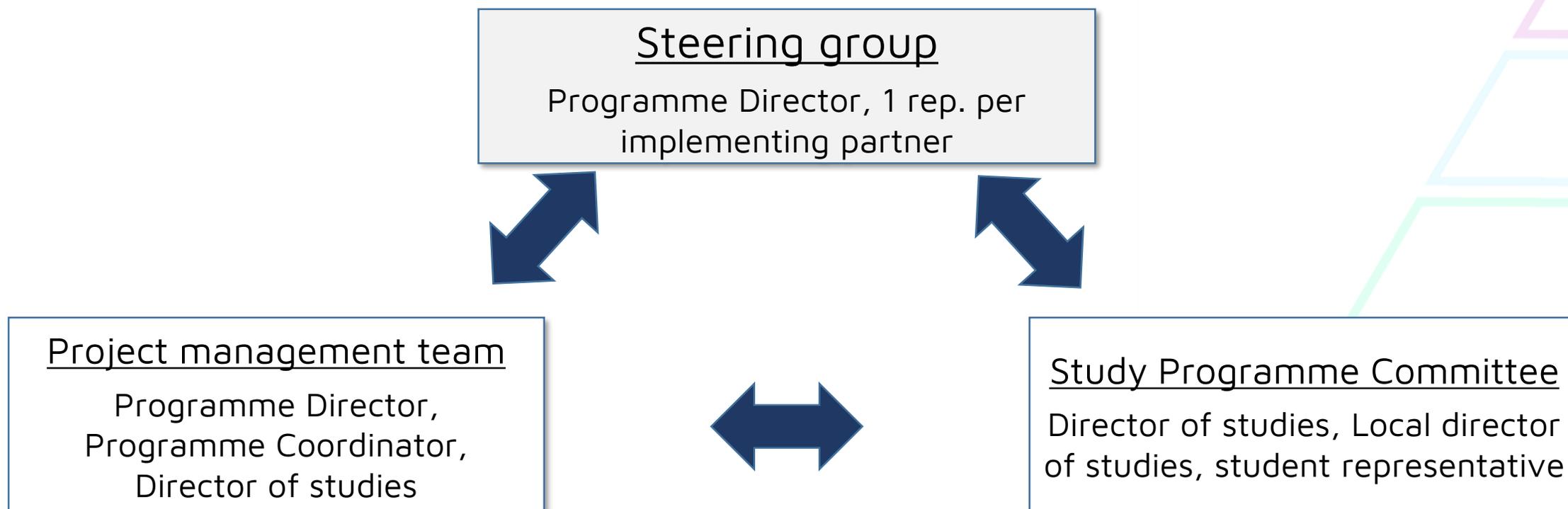
# Programme strengths



- 1 40 PhD students over a 5-year period
- 2 Develop MAX IV together with the Swedish synchrotron community
- 3 Professional training and career development including networking and mobility
- 4 Intersectoral and interdisciplinary secondments
- 5 Communication, dissemination and mutual knowledge transfer

A secondment at MAX IV is the basis of the program (minimum of 3 months)

# Governance structure



# Research areas

- healthy planet
- healthy people
- clean energy
- sustainable technologies
- accelerator science
- cultural and geological heritage



# Research projects

- Structure-guided design of antiviral agents targeting coronaviruses
- Liquid-liquid phase separation mediated by phosphorylated intrinsically disordered proteins
- Development and applications of quantum refinement for time-resolved crystallography
- Visualization of vulnerable plaques by complementary use of energy dispersive X-ray phase contrast tomography and conventional histology.
- Tracking ATP-Dependent Protein Dynamics
- Radiosensitization for radiation therapy - X-ray induced fragmentation in DNA.
- Structure and dynamics of solid-state formulations of biologics

- Migration of geologically stored hydrogen in bedrock
- Spectroscopic and geometric characterization of high-valent dinuclear metalloprotein intermediates
- In situ SAXS and XANES studies to probe the structure and chemistry of nanocellulose based water treatment materials
- The role of fungal communities in controlling mobilization of organic carbon (OC) and iron (Fe) from forest soils

## Generation of ultra-short light pulses with Accelerators

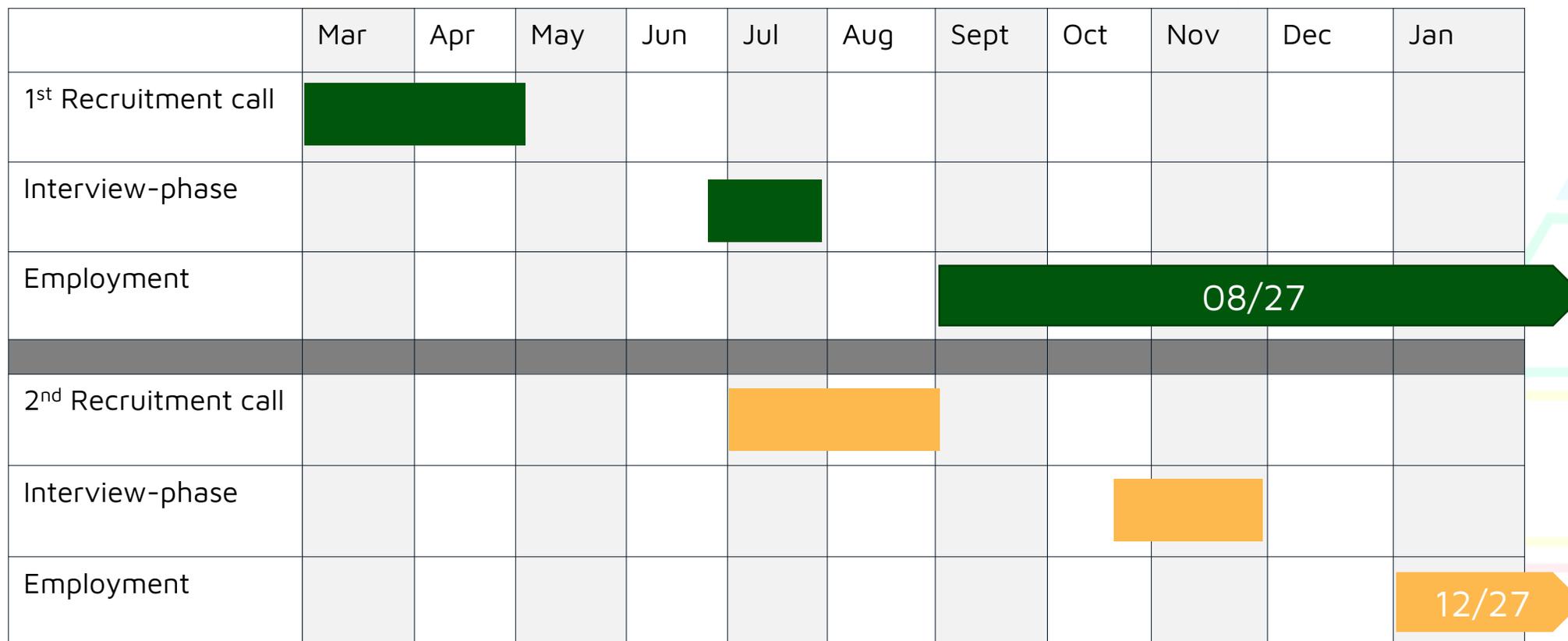
- Soft X-ray spectroscopy study of molecular semiconductors for durable organic photovoltaics
- Operando X-ray spectroscopy of semiconductor nanostructure devices
- Event-averaged and time-resolved ambient-pressure XPS as a new tool to study catalysis
- Stroboscopic operando spectroscopy of the dynamics in atomic layer deposition by event-averaging: experiment and theory
- Combining spectroscopy and diffraction for operando studies of complex oxides
- Resolving microsecond nanoscale fluctuations with X-ray Photon Correlation Spectroscopy at MAX IV
- Developing a platform for rapid multimodal operando analysis of batteries
- Bridging the gap between ultrafast and steady-state: Nanosecond optical pump and X-ray probe spectroscopy for chemical, bio-inorganic and materials sciences
- Thin film growth and dynamic processes in thin film solar cells by synchrotron spectroscopy
- Topology of Ultra Thin Metal Films on Semiconductors

APPLICATION THROUGH LOCAL HOST UNIVERSITY SYSTEM!

+ 13 PROJECTS IN 2<sup>ND</sup> CALL

- Misfit strain detection in precipitate hardening alloys by Bragg coherent diffraction imaging
- Elucidating time-resolved formation and assembly of lignin nanoparticles in the presence of metal ions
- In situ X-ray spectroscopy to unravel electrochemical CO<sub>2</sub> reduction mechanism to sustainable fuels and chemicals.
- In-situ corrosion in complex alloys
- Identifying Active Sites in Electrochemical Ammonia and hydrocarbon Synthesis via In Situ APXPS and XAS

# Recruitment



# Conducting a PhD in Sweden

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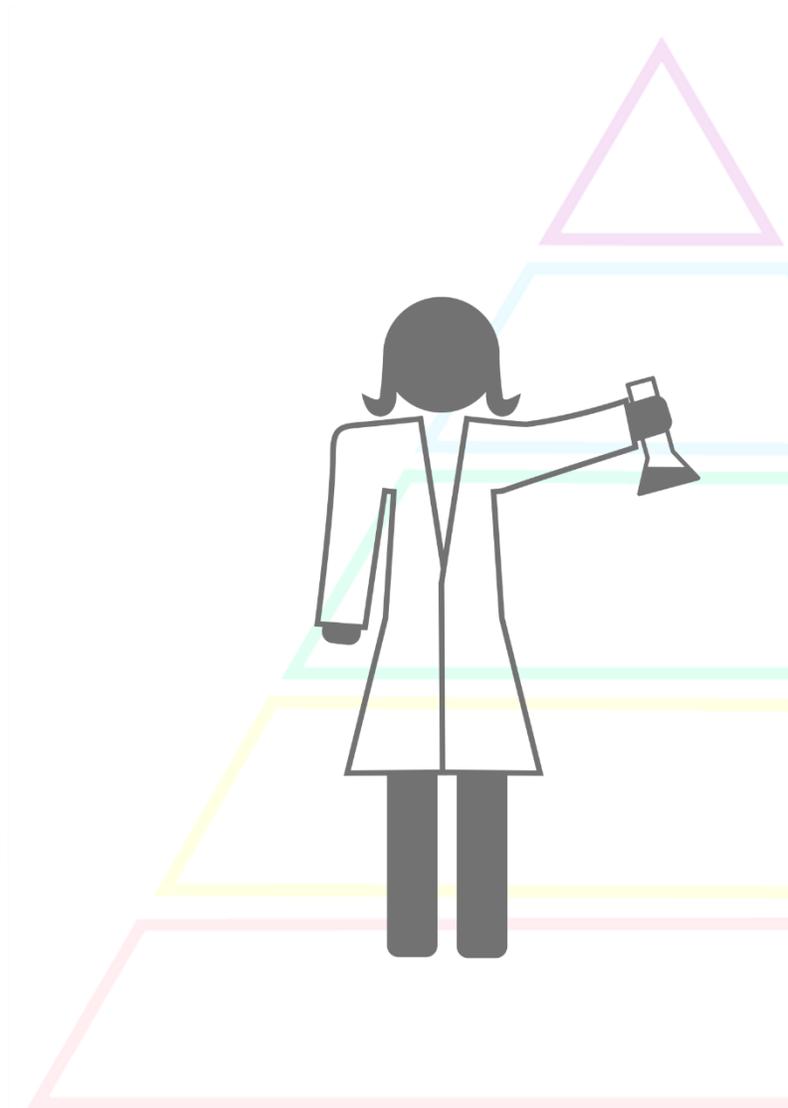
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# PhD studies in Sweden

Dual role: Student and employed research staff

- 4-year position, full-time
- Competitive salary with full benefits and protections (-> [general info](#))
- At least two supervisors:
  - 1 main supervisor – main responsible for planning and follow-up of your research training
  - 1 or more co-supervisors – provide specialized expertise, additional mentorship and advice, etc.
- Robust follow-up procedures to make sure your studies are on track and address any problems
- Culminates in a written dissertation and public defense; success results in award of PhD degree
- [Welcome to Sweden!](#)



# PhD studies in Sweden

Specific requirements are set by the program you're enrolled in.

- Defined in a "General Study Plan" for the specific degree program
- Usually: 60 ECTS of relevant courses.
  - Some required courses
  - Most are elective, but must be relevant for the student's education. Selection together with supervisor.
- Often: an intermediate thesis can be submitted after two years. After approved thesis and defense, the "Licentiate" degree is awarded.



# PRISMAS Training activities

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# PhD studies in the PRISMAS program

PRISMAS is a hybrid program combining research training in your scientific field with a specialization in synchrotron methods.

You will be enrolled as a doctoral student at one of the partner universities, but will spend a large portion of your time on PRISMAS-specific activities.

## Your Home University

- Enrollment in a PhD program in science or engineering
- Employment as a doctoral student
- Your main supervisor and 'home' research group
- Focus on training as an independent researcher in your main scientific field

## PRISMAS

- Research/development in collaboration with MAX IV staff
- Co-supervisor at MAX IV
- Focus on development of specialized expertise in synchrotron instrumentation and methods and related topics
- Dedicated activities for PRISMAS students:
  - Annual meeting in Lund
  - Summer schools

# PRISMAS learning objectives

We aim to train researchers who are:

- Able to use synchrotron methods effectively to enhance the quality and impact of research in their fields, and able to help others to do so.
- Able to communicate the principles of synchrotron methods, their applications and importance to various audiences, including scientists in their own fields, scientists in general, businesses and policymakers, and the public.
- Well-prepared for careers in industry, academia, or research infrastructure.

PRISMAS will give you:

Strong expertise in X-ray methods relevant to the thesis

Broad knowledge and understanding of X-ray methods and synchrotron facilities in general

Transferrable skills for future careers

# PRISMAS educational components

## Research/development at MAX IV!

- 3-12 month on-site secondment, integrated with MAX IV staff
- Experiments at MAX IV and other facilities via regular proposals

## Annual meetings!

- All PRISMAS students and supervisors will meet up once per year to discuss the PhD projects and developments at MAX IV. Linked to the annual MAX IV user meeting; attend both and you'll stay up-to-date on the most important developments in synchrotron science and engineering.

## Summer schools!

- Tutorials, scientific lectures, and hands-on exercises to develop knowledge and skills around a broad range of X-ray methods.
- Taught by experts from synchrotron facilities and experienced scientists.
- 3 schools, 1 week each, just for PRISMAS students.

## Courses!

- As a PRISMAS student, you should complete at least 20 ECTS in courses in X-ray science and methods or related topics. A variety of courses are offered by the PRISMAS network of universities.

# How to join PRISMAS

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# Eligibility criteria

Have you...

- Not resided in Sweden for more than 12 months within the period from 2020-05-01 until 2023-05-02?
- Achieved 240 ECTS (Masters Degree) in a relevant field?
- Not already been awarded a doctoral degree?
- The possibility to be available for the project start (September 2023)?

Answered all questions with YES?



[Apply here](#)

# Application package

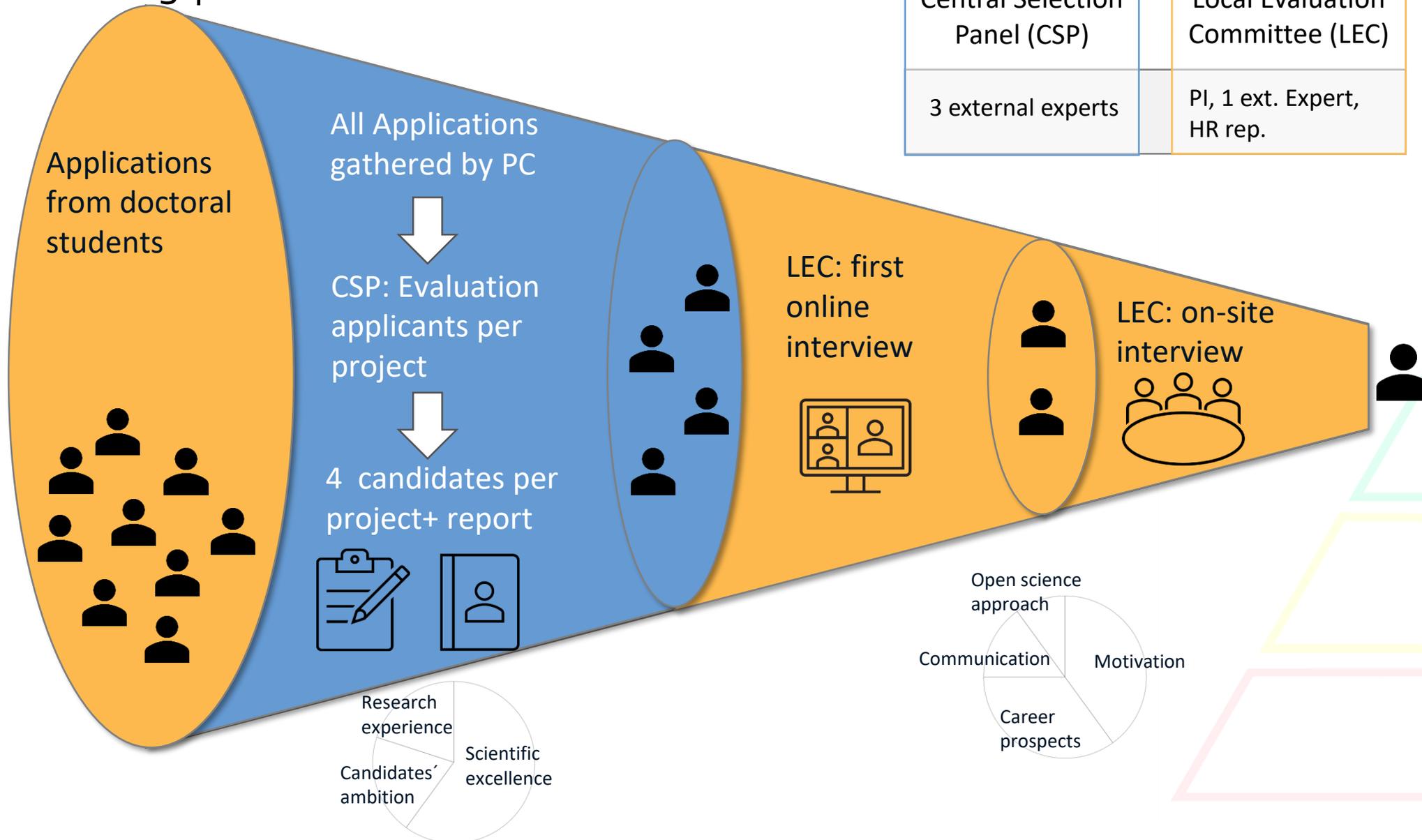


APPLICANTS  
GUIDE!



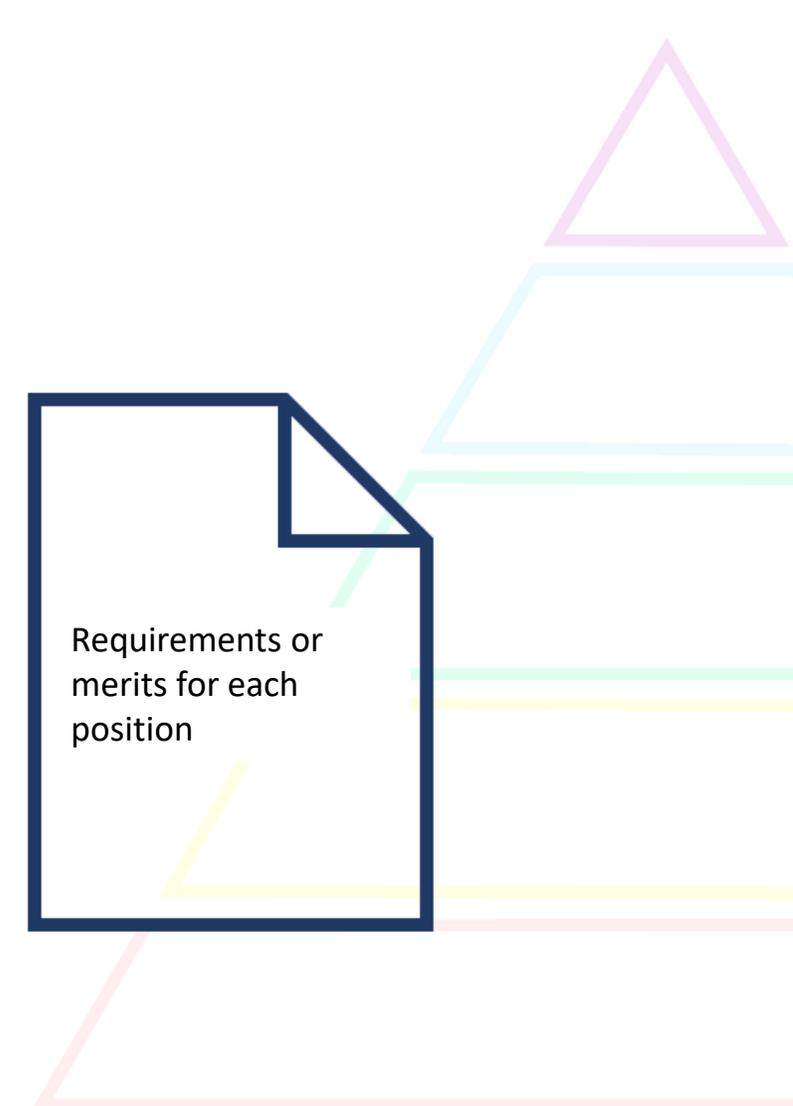
- CV in the Europass format, max 4 A4 pages ([download template here](#))
- Two-page cover letter (if you apply for more than one PRISMAS project at one or more universities you should include a priority ranking).
- Minimum one reference letter
- Proof of English language knowledge (minimum CEFR proficiency level B2).
- Academic transcript, including grades for all coursework, with a transcript of a diploma in English.
- Additional documents you consider relevant for the application – specific for each position (check Job Ad)

# Recruiting process of candidates



# Evaluation criteria

Criteria	Weight	Description
<b>Scientific excellence</b>	60%	Academic education and training, relevant courses and grades; Academic excellence (incl. prizes, publications, participation in international programmes such as Erasmus); Dual degree/diploma
<b>Adequacy of the career plan and the thesis project</b>	20%	Ambition both in relation to the PRISMAS Project/s applied for and in relation to the applicant's research interests more broadly.
<b>Research experience</b>	20%	Research environments within and outside of the Higher Education sector, as well as sectors and organisations which are impacted by research outcomes.



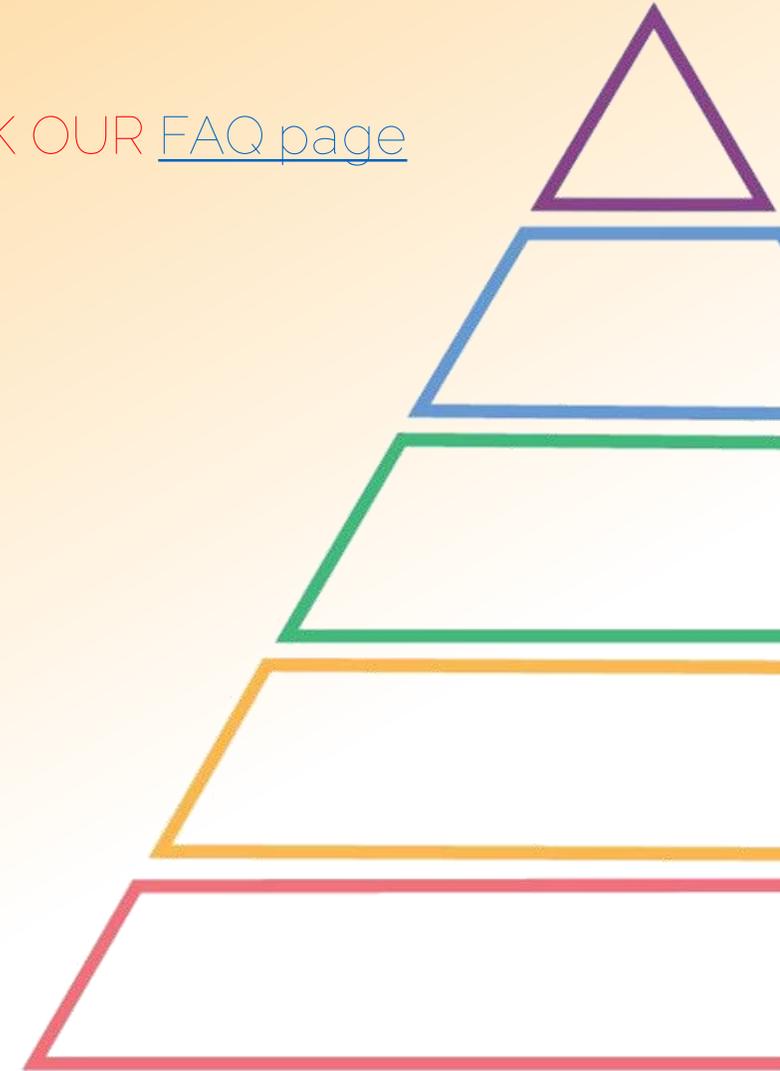


PLEASE CHECK OUR [FAQ page](#)

# Q&A

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# Thank you!

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Contact



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[prismas@maxiv.lu.se](mailto:prismas@maxiv.lu.se)

