

WISE

Wallenberg Initiative
Materials Science
for Sustainability

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

WISE

Wallenberg Initiative Materials Science for Sustainability

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

WISE

Wallenberg Initiative Materials Science for Sustainability

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*



Wallenberg Initiative
Materials Science
for Sustainability

**Materials science
that enables
a sustainable world**

Outline

- What is WISE?
- Organization & People (WISE-Board, -URG, -PD, -PO, -AC, -ISAB)
- WISE Program Office (PO, P. Norberg)
- Communication
- Research and Technology Platforms (WISE-RTP)
- Graduate School (WISE-GS, A. Delin)
- Research Arenas with Industry (WIRA, M. Svensson)
- Guest Professors
- Strategic Recruitments
- Past, Current and Future Calls (WISE-ap/ip)
- WISE Faculty

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

A few key dates

- KAW, Göran Sandberg: *material science for sustainability* presented and initiated (April 2021)
- Report submitted to KAW (May 2021)
- WISE Memorandum submitted to KAW (authors: Berggren, de Laval, Eriksson, Kloo, Linke, Palmquist, and Rosén, November 2021)
- KAW Board decided to initiate the WISE program (November 2021)
- WISE is “pre-started” (January 2022)
- WISE Board is constituted, Sara Mazur as Chair (March 2022)
- WISE University Representative Group (Chalmers, KTH, LiU, LTU, LU, SU, UU, KaU, and UmU, March 2022)
- Strategic recruitments and WISE-ap1 call is opened (Spring/Summer 2022)
- Inauguration (September 2022)

PARTICIPATING UNIVERSITIES



FUNDED BY



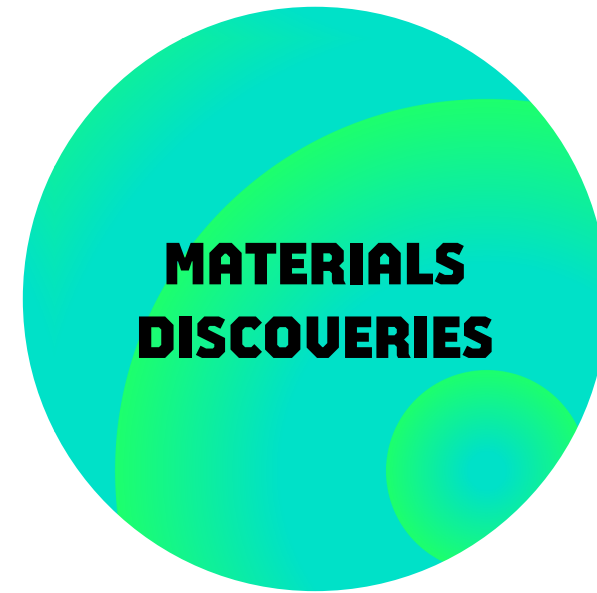
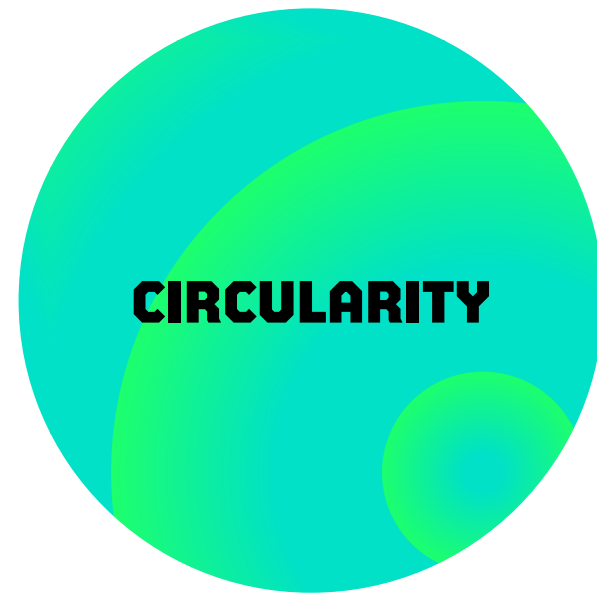
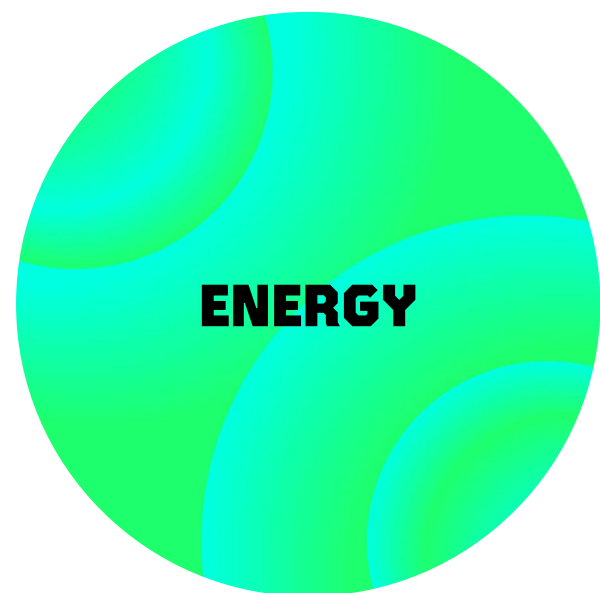


A sustainable future through materials science

WISE is a Swedish research program in materials science for sustainability, initiated, and financed by the Knut and Alice Wallenberg Foundation.

- M€ 300 spanning 2022–2033
- Strategic recruitment of 28 asst/assoc professors
- Educating 186 PhD students and 186 postdocs
- Advanced instrumentation
- Research arenas with Swedish industry
- Graduate school
- Guest professor programs

Thematic areas



wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY



Thematic areas

i. Conversion, storage, distribution of clean energy

ii. Circular materials replacing rare, energy-demanding, hazardous materials

iii. Mitigation, cleaning, and protection of atmosphere, soil, water

iv. Discovery of materials for novel sustainable technologies & applications

wise-materials.org

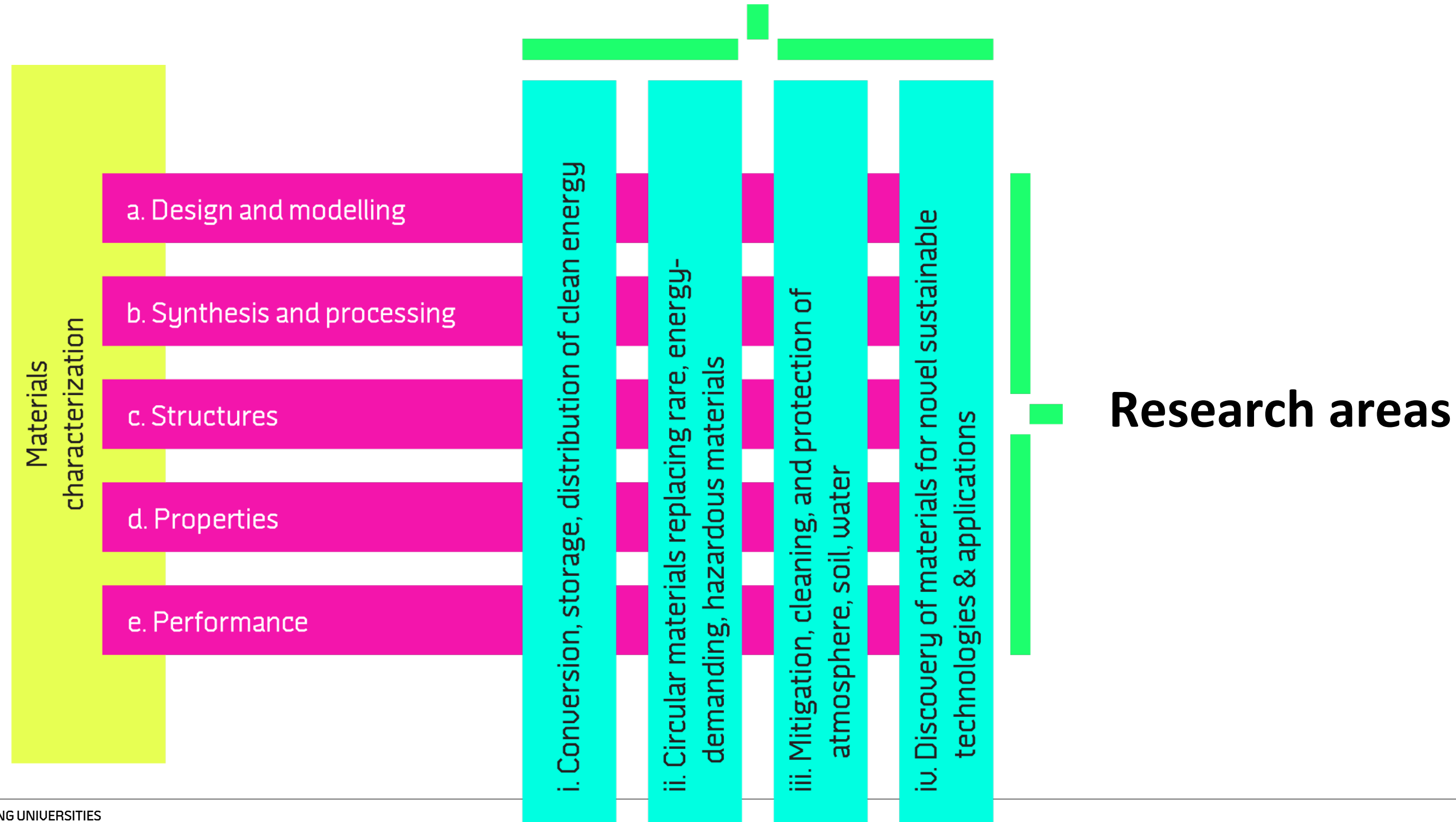
PARTICIPATING UNIVERSITIES



FUNDED BY



Thematic areas



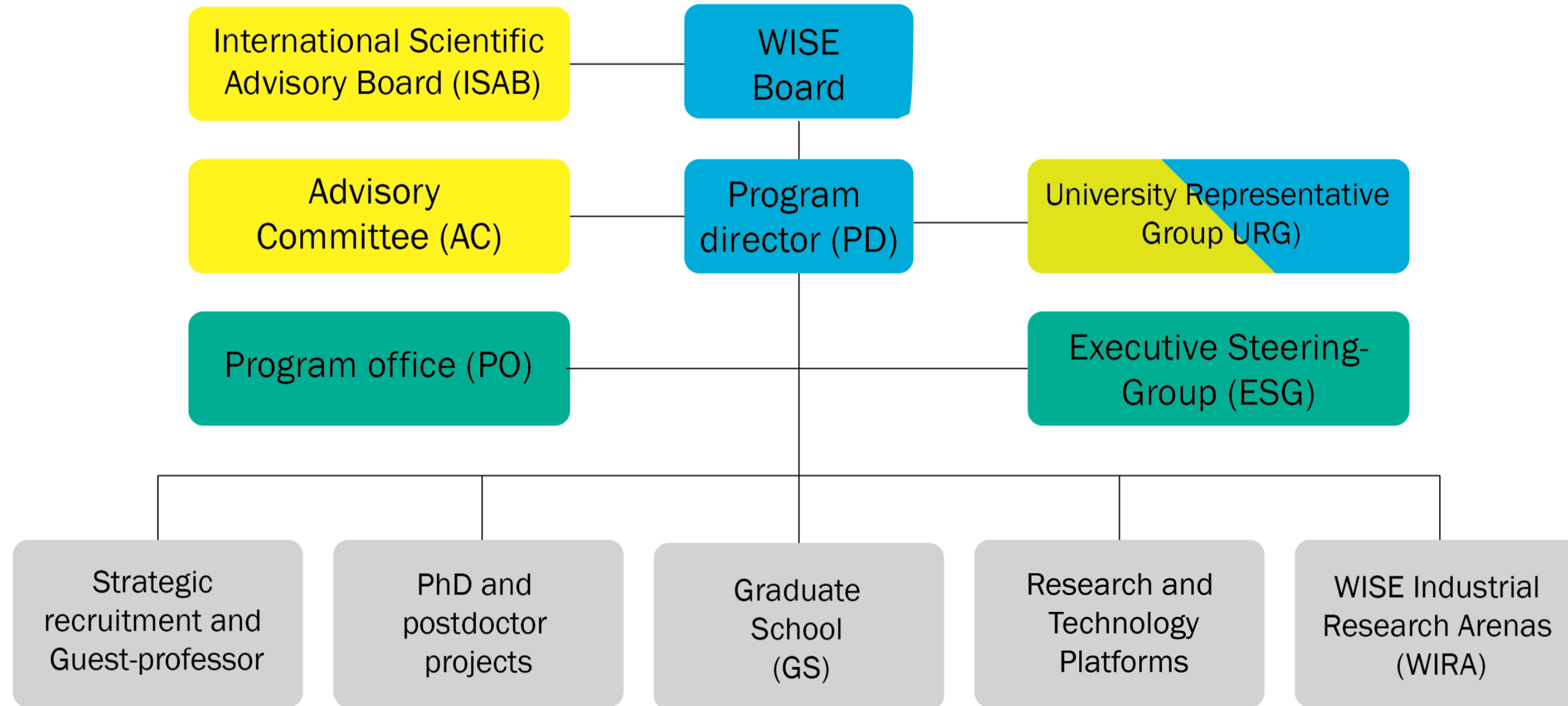
wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY





wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY





WISE Directors & PO

Directors



Magnus Berggren
Program Director



Olle Eriksson
Co-Director

Activities



Magnus Svensson
Director WIRA



Anna Delin
Director of WISE
graduate school

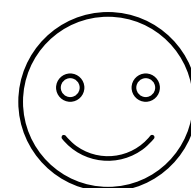
Program office



Petronella Norberg
Program
coordinator



Erna Delczeg
Research
coordinator



NN
Program
controller



Peter Värbrand
Research
coordinator



Daniel Simon
Research
coordinator



Raquel Lizarraga
Jurado
Science writer



Jessica Andersson
Communications
officer



Jennie Jordanlöv
Event Coordinator
Administrator



Professor Maria
Abrahamsson
Chalmers University of
Technology



Professor Paul Erhart
Chalmers University
of Technology



Professor Johanna Rosén
Linköping University



Professor Xavier Crispin
Linköping University



Professor Xiaodong Zou
Stockholm University



Professor Lennart Bergström
Stockholm University



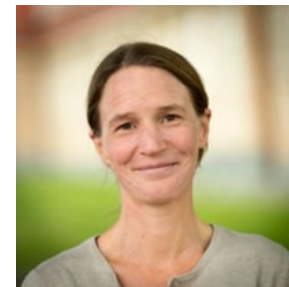
Professor Lars Kloo
KTH Royal Institute
of
Technology



Professor Annika
Borgenstam
KTH Royal Institute of
Technology



Professor
Håkan Rensmo
Uppsala
University



Professor Charlotte
Platzer-Björkman
Uppsala University



Professor
Anders
Mikkelsen
Lund University



Professor Kimberly
Thelander
Lund University



Professor Marta-Lena
Antti
Luleå University of Technology



(adjunct)
Professor Klas
Tybrandt
Linköping
University



(adjunct)
Professor Malin
Selleby
KTH Royal
Institute of
Technology

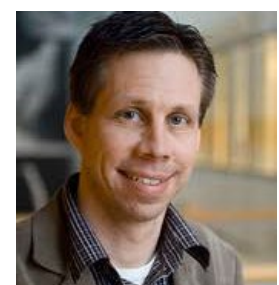


Board of Directors - AC

WISE Board



Sara Mazur
Chair WISE



Anders
Palmqvist
VICE Chair
WISE



Fredrik
Overgaard
Stena Recycling



Annika Stensson-
Trigell
KTH Royal Institute
of Technology



Johan Tysk
Uppsala
University



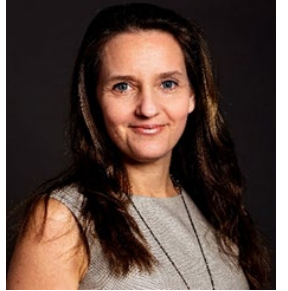
Per Dannelun
Linköping
University



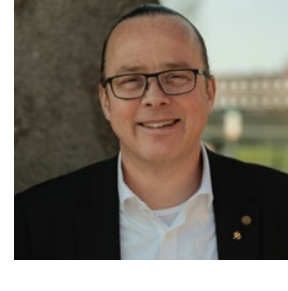
Henrik Cederqvist
Stockholm
University



Mikael
Dahlgren
ABB



Maria Persson
Gulda
H2 Green Steel



Viktor Öwall
Lund University



Eva Gustavsson
Tetra Pak

Advisory committee



Lars Hultman
President of
Advisory
committee



Caroline
Ankarcrona
KAW



Christina Rudén
Stockholm
University



Malin Baltzar
H2 Green
Steel



Mats W Lundberg
Sandvik



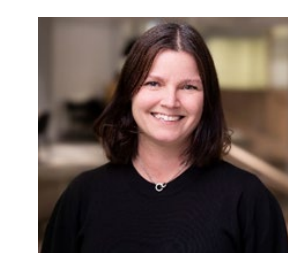
Jan-Eric Sundgren
Volvo AB



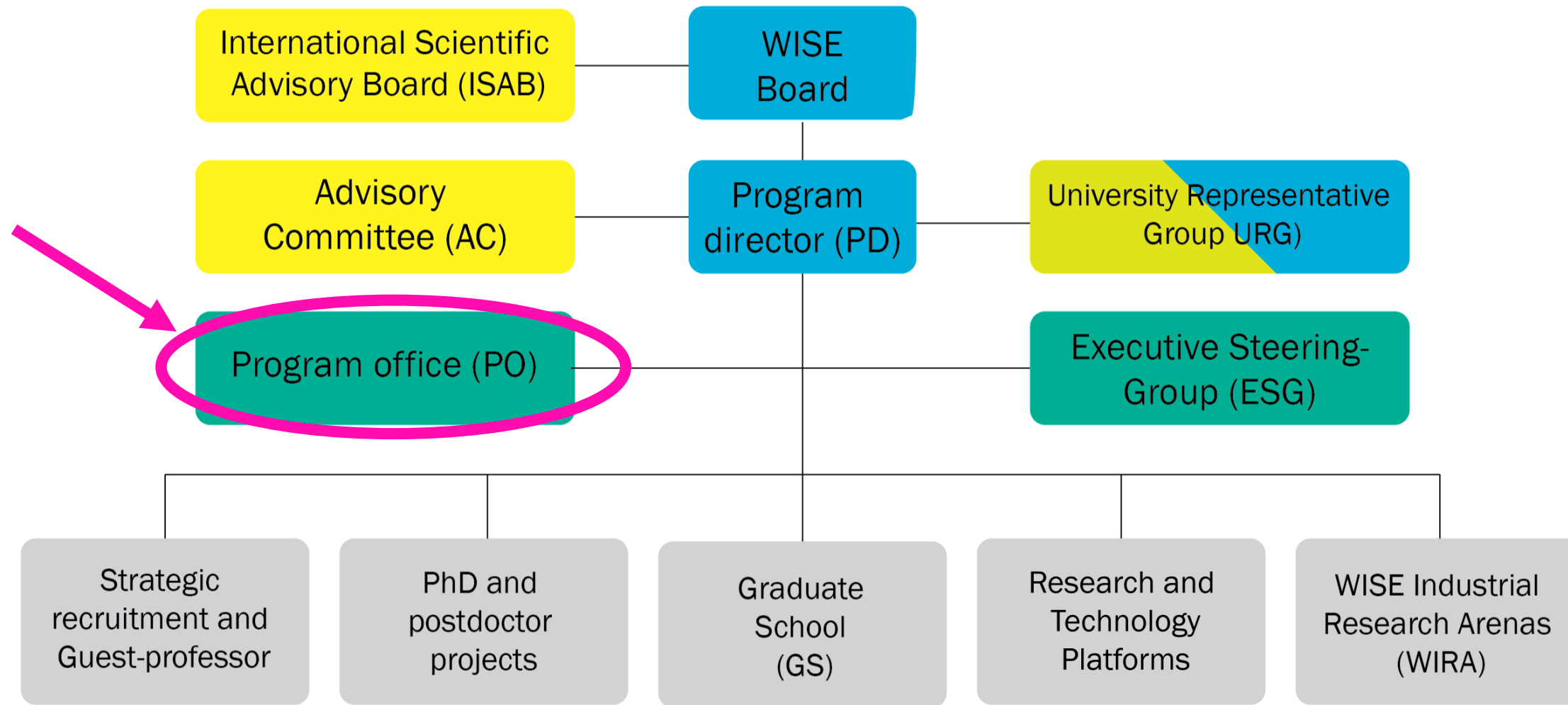
Jochen Schneider
RWTH-Aache



Pär Weihed
Luleå University of
Technology



Maria Åstrand
Northvolt



- Coordination
- Administration
- Information
- Communication
- Meetings & Events
- Financial matters

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY





Wallenberg Initiative
Materials Science
for Sustainability

WISE Program Office (P. Norberg)



**Petronella
Norberg**
Program
coordinator



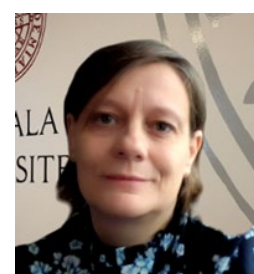
Daniel Simon
Research
coordinator



**Jessica
Andersson**
Communications
officer



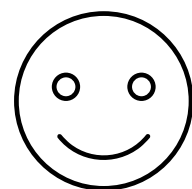
Jennie Jordanlöv
Event Coordinator
Administrator



Erna Delczeg
Research
coordinator



**Raquel Lizarraga
Jurado**
Science writer



NN
Program
controller



**Peter
Värbrand**
Research
Coordinator



wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*



Wallenberg Initiative
Materials Science
for Sustainability

WISE Program Office (P. Norberg)

Email

- info@wise-materials.org
- “WISE”
- We will use your “official” email address

Intranet

- (next slide)

**Do not hesitate to contact us
– we are here to help you!**

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*



- One of our communication platforms, the intranet
- WISE intranet launched in January 2023. Aim to:
 - create engagement
 - guidelines
 - templates
 - news
 - information about events and lots more
- still under construction. Let's build the intranet together

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

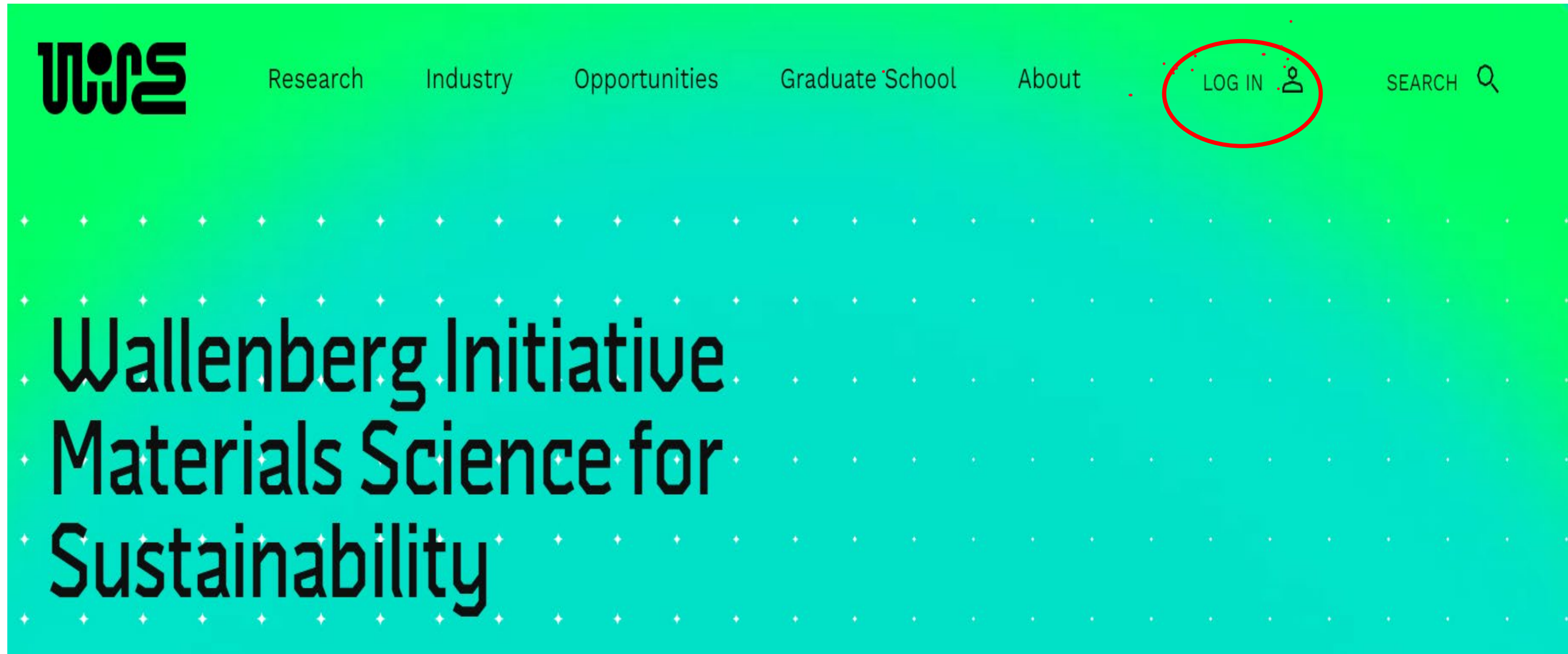
*Knut and Alice
Wallenberg
Foundation*



Wallenberg Initiative
Materials Science
for Sustainability

WISE Communication (R. Lizarraga)

Encourage you to register to the intranet on our web-site.



wise-materials.org

PARTICIPATING UNIVERSITIES





FUNDED BY


*Knut and Alice
Wallenberg
Foundation*



WIS

Research Industry Opportunities Graduate School About

LOG IN  SEARCH 

BACK 

Sign in to Wise Intranet

Are you a member/affiliate or have an account?
Request access | Forgot password

Username or Email Address

Password

Remember Me

Log In

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY





WIS | WISE | Customize | + New | Edit Page | Events | Howdy, Jessica Andersson

WIS | Resources | Graduate School | Research | Calendar | PROFILE | SEARCH

WISE INTRANET | GO TO WISE-MATERIALS.ORG

Resources

- The WISE Handbook
- Economy Handbook
- Documents
- Templates
- Contact

News

◀ PREVIOUS | NEXT ▶

wise-materials.org

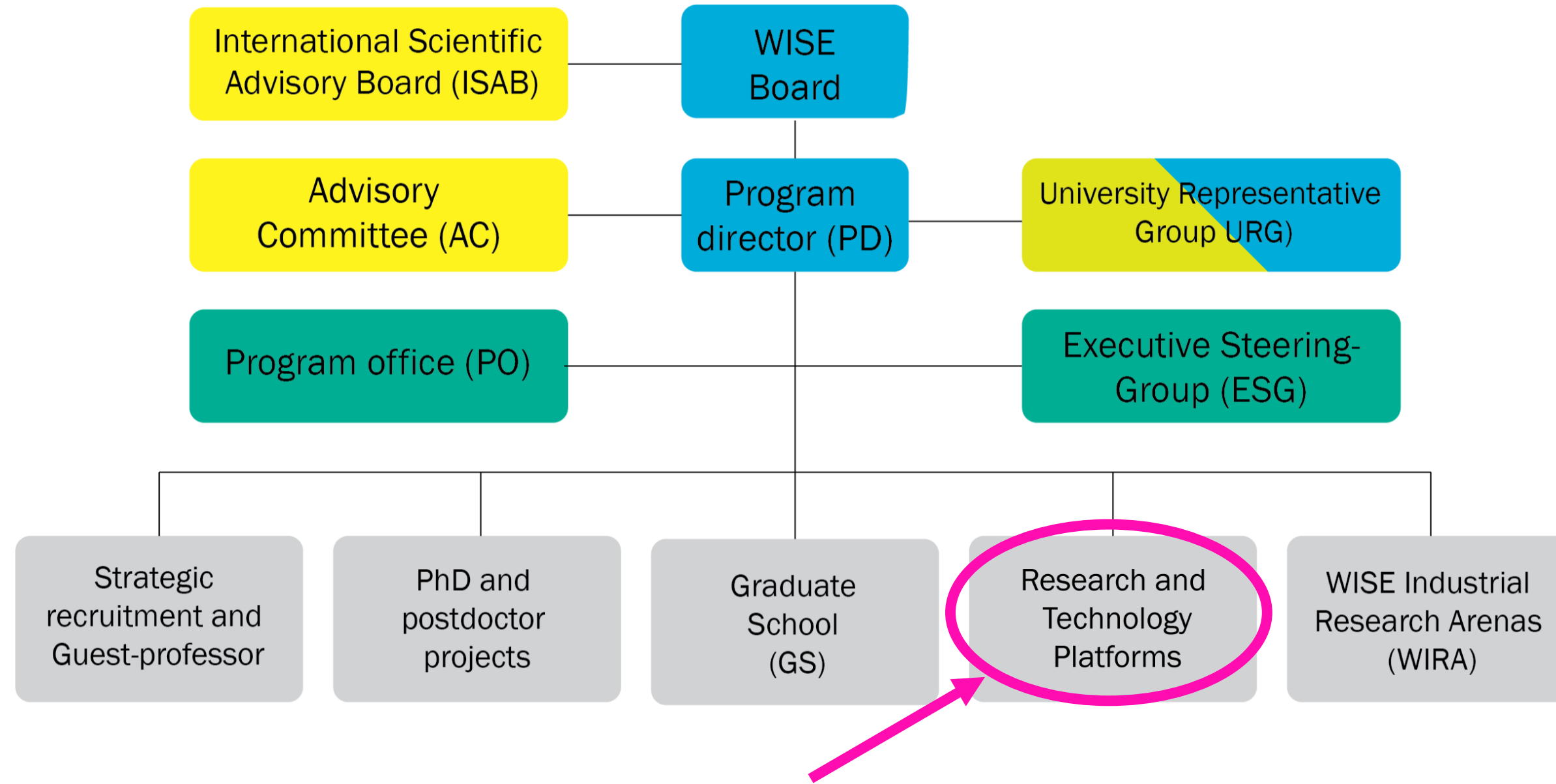
PARTICIPATING UNIVERSITIES



FUNDED BY



Research and Technology Platforms (WISE-RTP)





Research and Technology Platforms (WISE-RTP)

Vision: Internationally competitive science infrastructures that enable outstanding material science for sustainability, for a broad Swedish user basis.

Mission: Significant research infrastructures for both basic and need-driven materials science for sustainability, of strategic importance for the thematic areas of WISE, and positioned within the national and international landscape of already existing research infrastructures.

Strategy: Provide academic researchers in materials science at Swedish universities with significant research infrastructure platforms. These platforms range from off-the-shelf available equipment to in-house made advanced instruments, which are made easily and broadly accessible through professional organizations, *e.g.*, MyFab and MAX IV. The WISE platforms are planned to be well-integrated within existing and planned infrastructures, both at the universities and other external sources' (like VR) infrastructure initiatives. Furthermore, the needs in society, and research strategies of WISE and the international research frontier in materials sciences are relevant parameters for the design of the WISE R&T Platforms. The primary target is to fund platforms that can fill the gap between individual instruments and large-scale national or international facilities.

Goal: WISE R&T Platforms are critical tools in synthesis and characterization of materials, training individuals for academic and industrial research in materials science, and for WISE outreach. These platforms will also contribute substantially to make Swedish universities competitive in an international arena and provide a basis for all activities across the WISE matrix.

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY





Research and Technology Platforms (WISE-RTP)

Advanced Analytical Equipment

Env. Electron microscopy center*	LU	65M
Advanced Electron Microscopy	LiU	20M
Sustainable Metals STEM	KTH	28M
Cryo Microscopy Platform	CTU	20M
Materials Analysis Platform	CTU	23M
Electron Microscopy Center	SU	62M
WISE ACT@LUMINA	LTU	58M
Ambient Pressure XPS	CTU	15M
Ångström Laser Endstation XPS/D	KTH	20M
Near Ambient Pressure XPS	LiU	20M
Ultrafast Operando XPS	SU	25-30M
LigHT	UU	60M
Mass Spectrometry Imaging	CTU	27M

Chemical synthesis and analysis

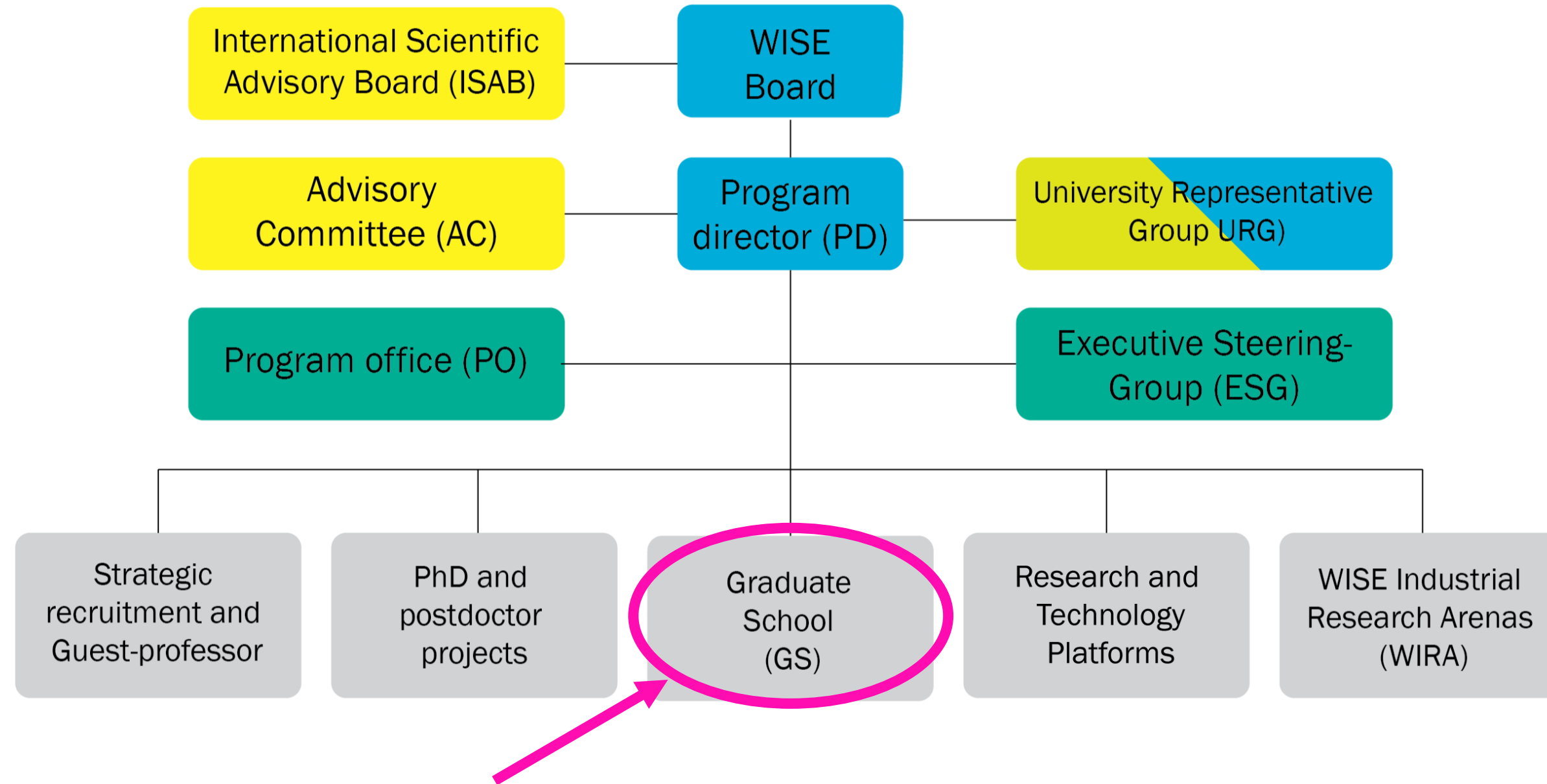
CircuLab	SU	40M
ssNMR#	KTH	90M
High-field NMR and micro-MRI#	SU	90M
SAXS-WAXS	LU	15M
Polymer Lab	KTH	20M

Materials processing, fabrication & analysis

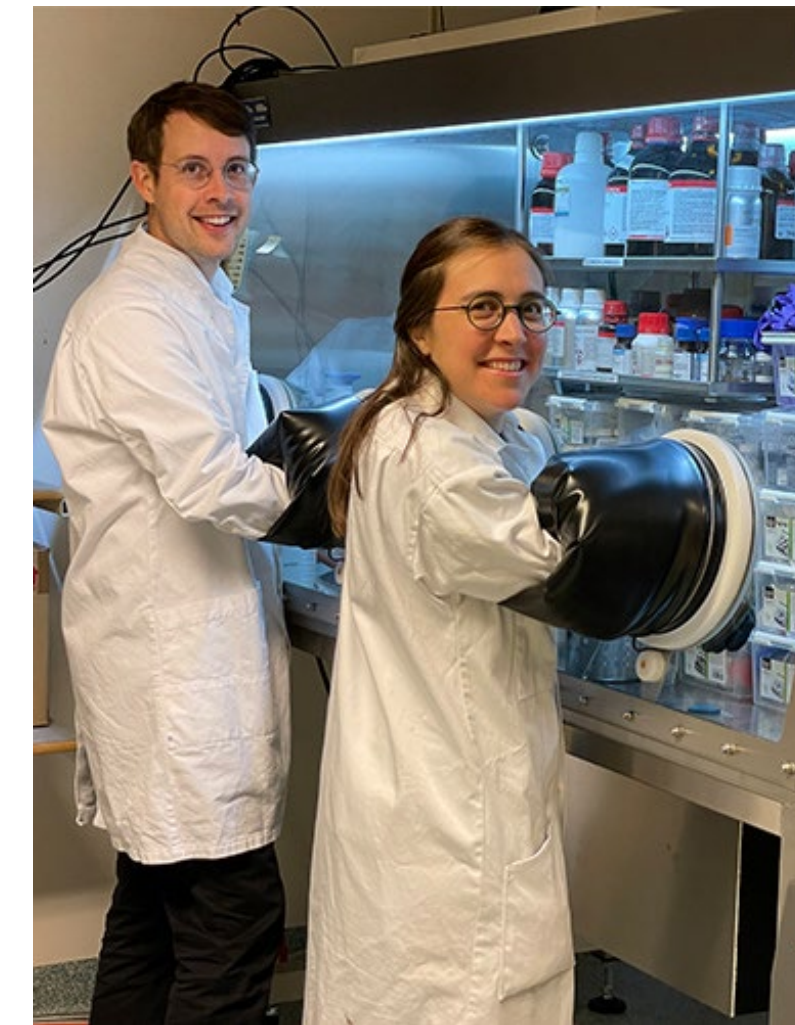
AM @ UU	UU	26M
AM @ CTU	CTU	23.5M
WiseEST @ UU	UU	33M
Wise EST @ LTU	LTU	33M
Atom Fab Lab @ ANL	KTH	30M
Sust. struct. and manufacturing arena	LiU	20M
Lab of mat. for sust. manufacturing	LiU	29M
Battery manufacturing	CTU	6.5M
Molecular beam epitaxy	CTU	10M
Physical property meas. system	CTU	12M
Nanoimaging laboratory	LiU	22M
Nanolab Science Village for sust. mat.	LU	63M

Large Facilities

Ångström Laser	UU	200 M
Neutron Science Platform	UU	131 M



- 186 PhD students, 186 postdocs
- Mandatory PhD course: FSK3003 “Sustainable development for WISE PhD students”, 7.5 ECTS
- Study trips, both international and within Sweden
- Welcome meeting in August every year, for newcomers
- Summer school every year, starting in 2024
- Development of new topical courses, by experts within the WISE faculty
- Frequent opportunities for networking between industry and academia
- Mentor program, journal clubs
- Student council
- Social events, team-building activities, alumni network



PARTICIPATING UNIVERSITIES



FUNDED BY

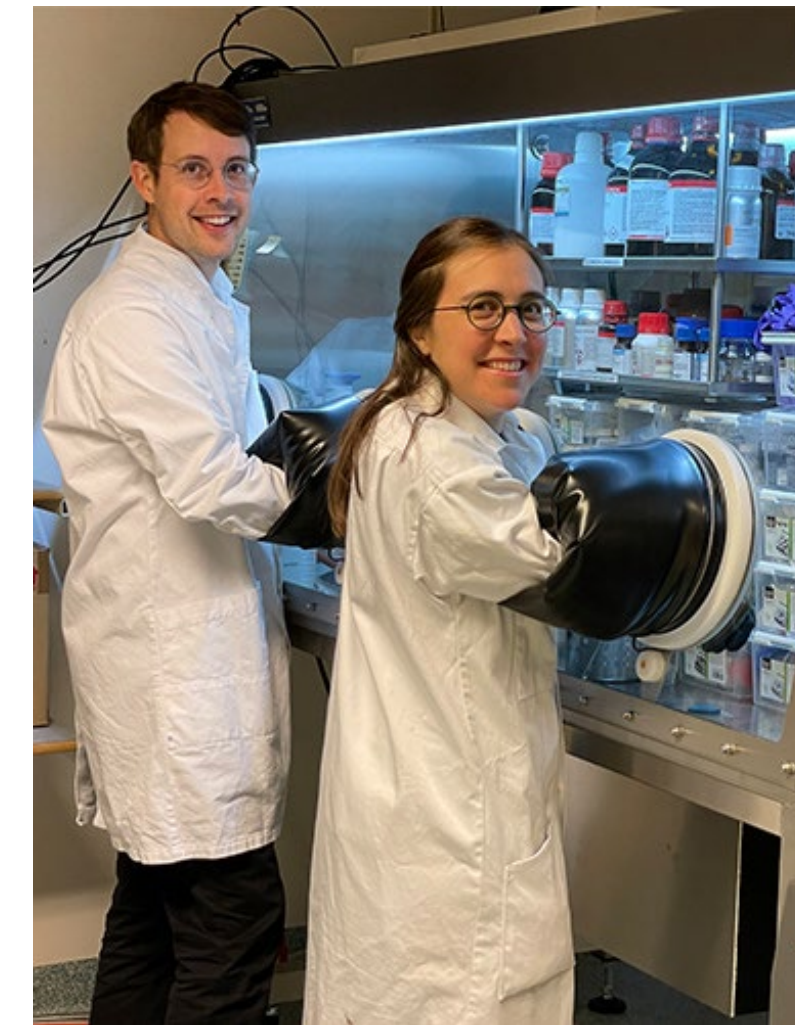
*Knut and Alice
Wallenberg
Foundation*

Involve the participants in running and developing the GS. Examples:

- Industry postdocs and PhD students can organize study visits to their work place
- Postdocs and senior PhD students can organize journal clubs and team-building activities

Build in interaction between industry and academia. Examples:

- Summer schools organized around thematic areas and value chains. Speakers and participants from both industry and academia.
- Colleagues of the industry postdocs and PhD students can be involved as mentors.



PARTICIPATING UNIVERSITIES

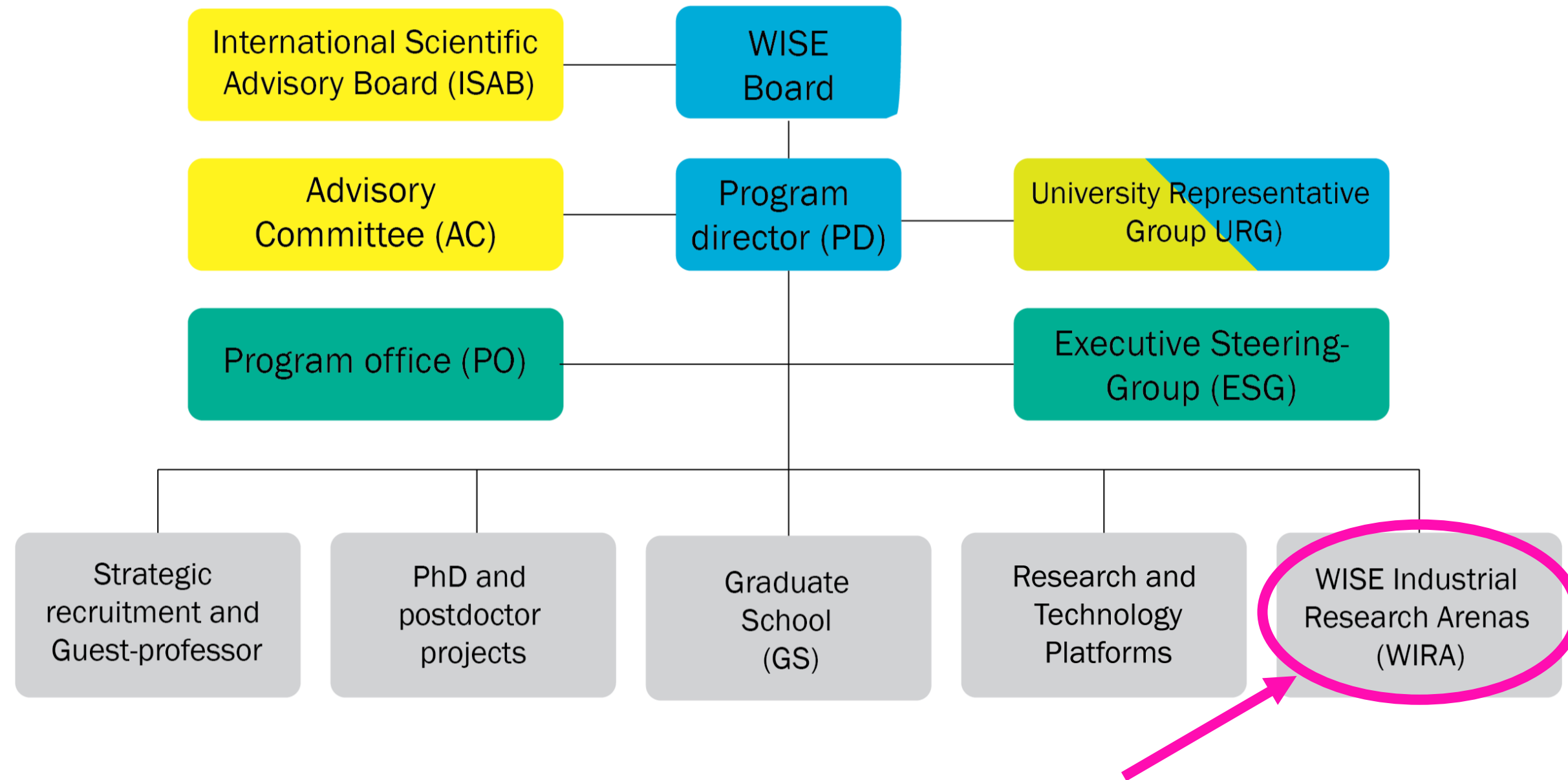


FUNDED BY

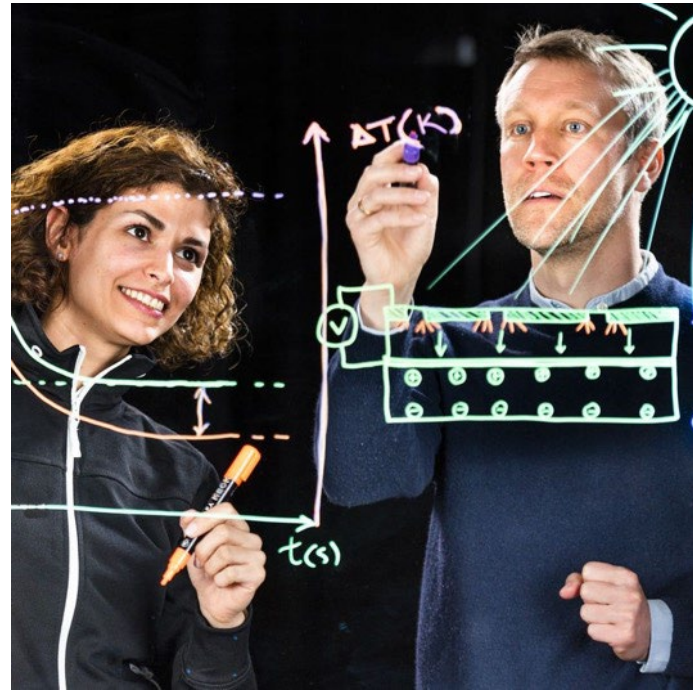
*Knut and Alice
Wallenberg
Foundation*

- Yearly meeting, to welcome all new WISE participants
- 28-30 August 2023 – official kick-off for the graduate school
- Venue: Kolmården
- About 200 participants this year
- Present KAW, WISE and the graduate school
- Interesting talks from both industry and academia – focus on sustainability
- Poster session – graduate school participants present their projects
- Common activities in the park, a quiz (based on the posters), and entertainment





Research Arenas with Industry [WIRA, M. Svensson]



Research or development settings, established outside of academia, where scientists and engineers from academia and industry jointly explore materials science for sustainability.

wise-materials.org

PARTICIPATING UNIVERSITIES

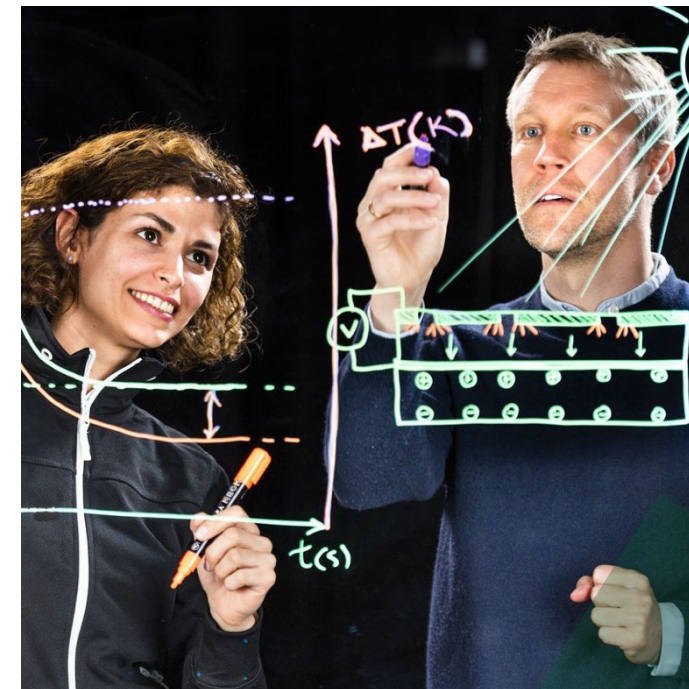


FUNDED BY



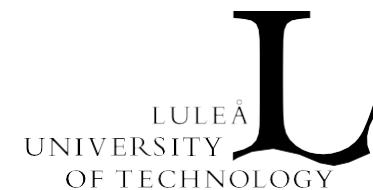
Research Arenas with Industry (WIRA, M. Svensson)

- Industry takes the lead
- More than one company
- Formulate a research agenda/challenge
- Bridging fundamental science with societal/industrial needs and relevance
- Meeting place to support mutual learning and exchange of needs and knowledge
- Industrial/societal needs, challenges and opportunities spark new scientific topics
- Resulting in co-creating research teams
- World leading fast industrial/societal uptake



wise-materials.org

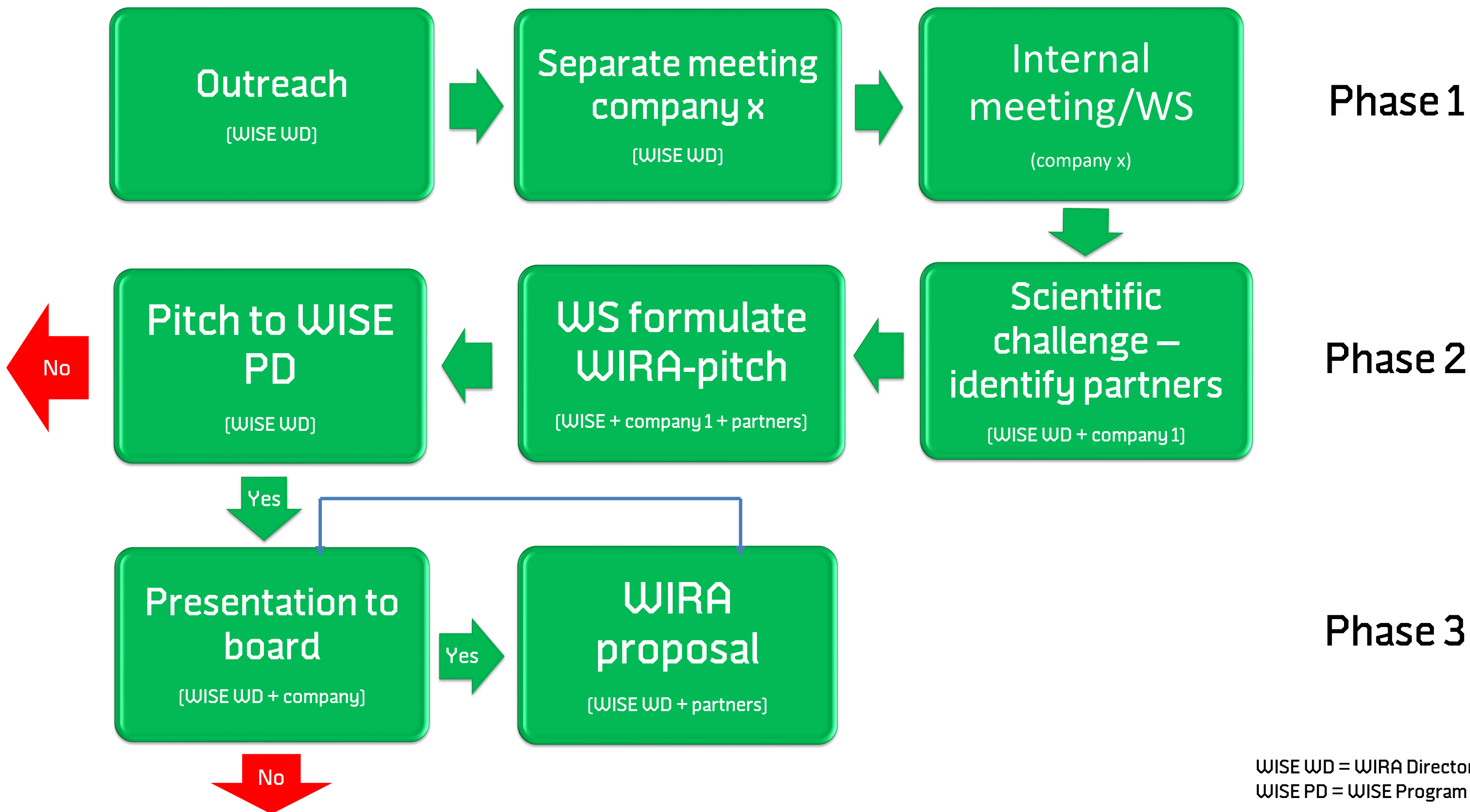
PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

Research Arenas with Industry [WIRA, M. Svensson]



WISE WD = WIRA Director
WISE PD = WISE Program Director

Proposed WIRA subjects

- Recycling and separation – Recycler and Automotive Electronics, ceramics, metals, plastics
- CO2 neutral materials – larger consumer products from cradle to grave
- Sustainable electrochemical technologies – e.g. fuel-cells, bio-fuels, ... materials, testing and production
- MAX IV – sample preparation and experimental setup
- Replacing PFAS
- Hydrogen – production, storage, distribution
- Batteries – beyond Li-ion

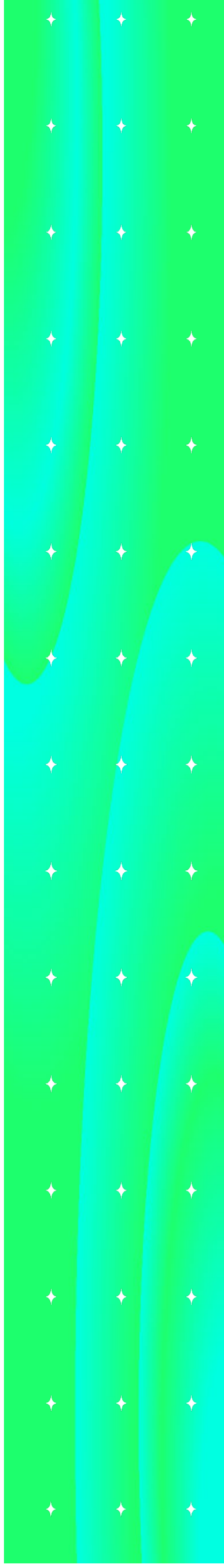
wise-materials.org

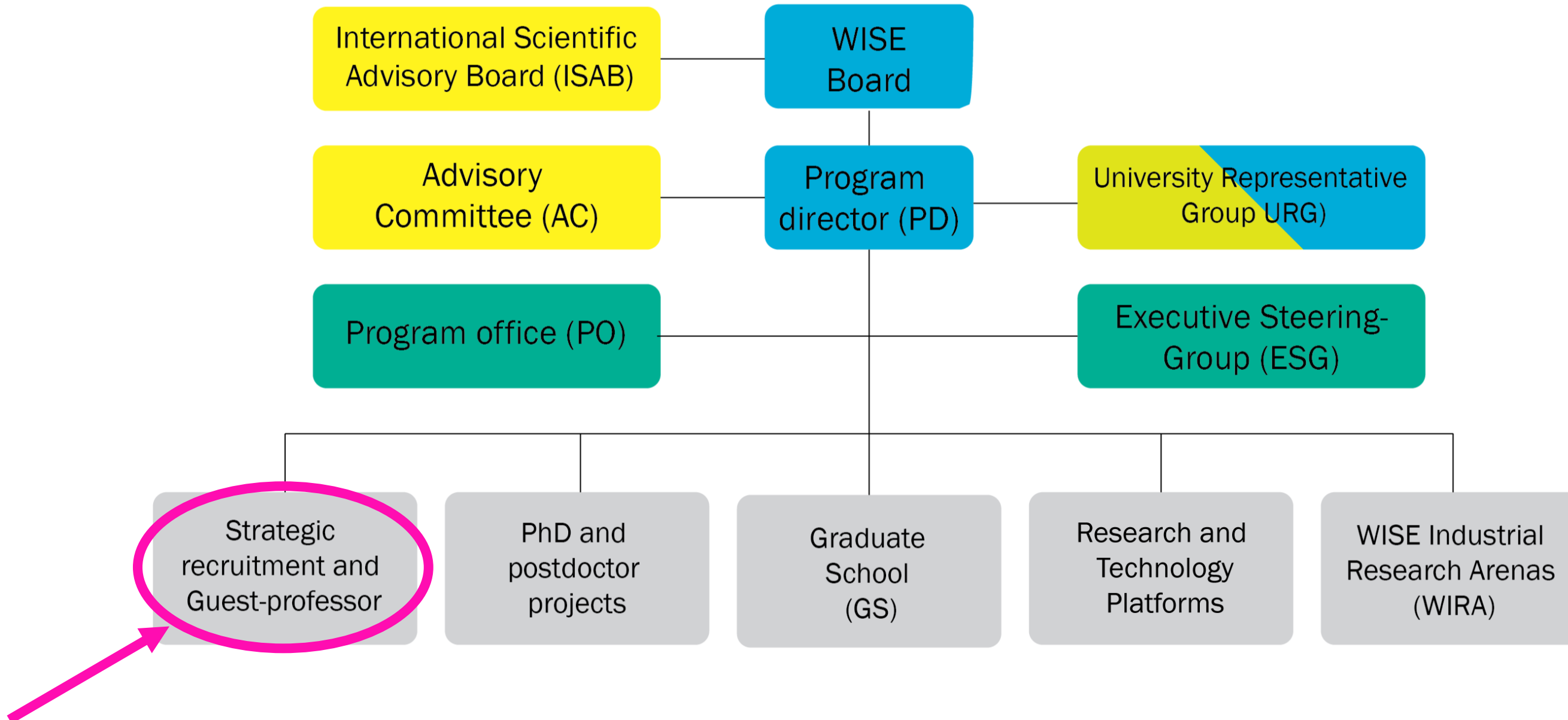
PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*





Univ	Short position title	Status
CTH	Synthesis of novel functional...	Candidate approved
CTH	Discovery of sustainable materials...	Candidate approved
KTH	Materials science with a focus...	Under expert evaluation
KTH	Electrocatalytic materials...	Under expert evaluation
LiU	Organic Electronics: Additive structuring...	Under expert evaluation
LiU	Low-dimensional inorganic materials...	Expected to be reopened early Jan
LTU	Sustainable and efficient metal recovery...	Waiting for evaluator report in January
LTU	Atom- and multi-scale modelling...	Waiting for evaluator report in February
LU	Synthesis of inorganic materials...	Candidate accepted Decision letter sent
LU	Development of material heterostructures...	Candidate accepted Decision letter sent
SU	Materials chemistry towards nano porous...	Candidate approved
SU	Organic synthesis towards...	Candidate selected
SU	Materials chemistry towards...	Candidate selected
UU	Magnetic or optical materials...	Evaluators reports received
UU	Geohydrology with specialization in...	Evaluators reports received



wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY



- 2023 a trial year!
- 7 guest professors to be invited to the 7 WISE universities
- Possibility for each university to fund one additional guest professor
- Launching the full-scale WISE guest professor program during 2024

wise-materials.org

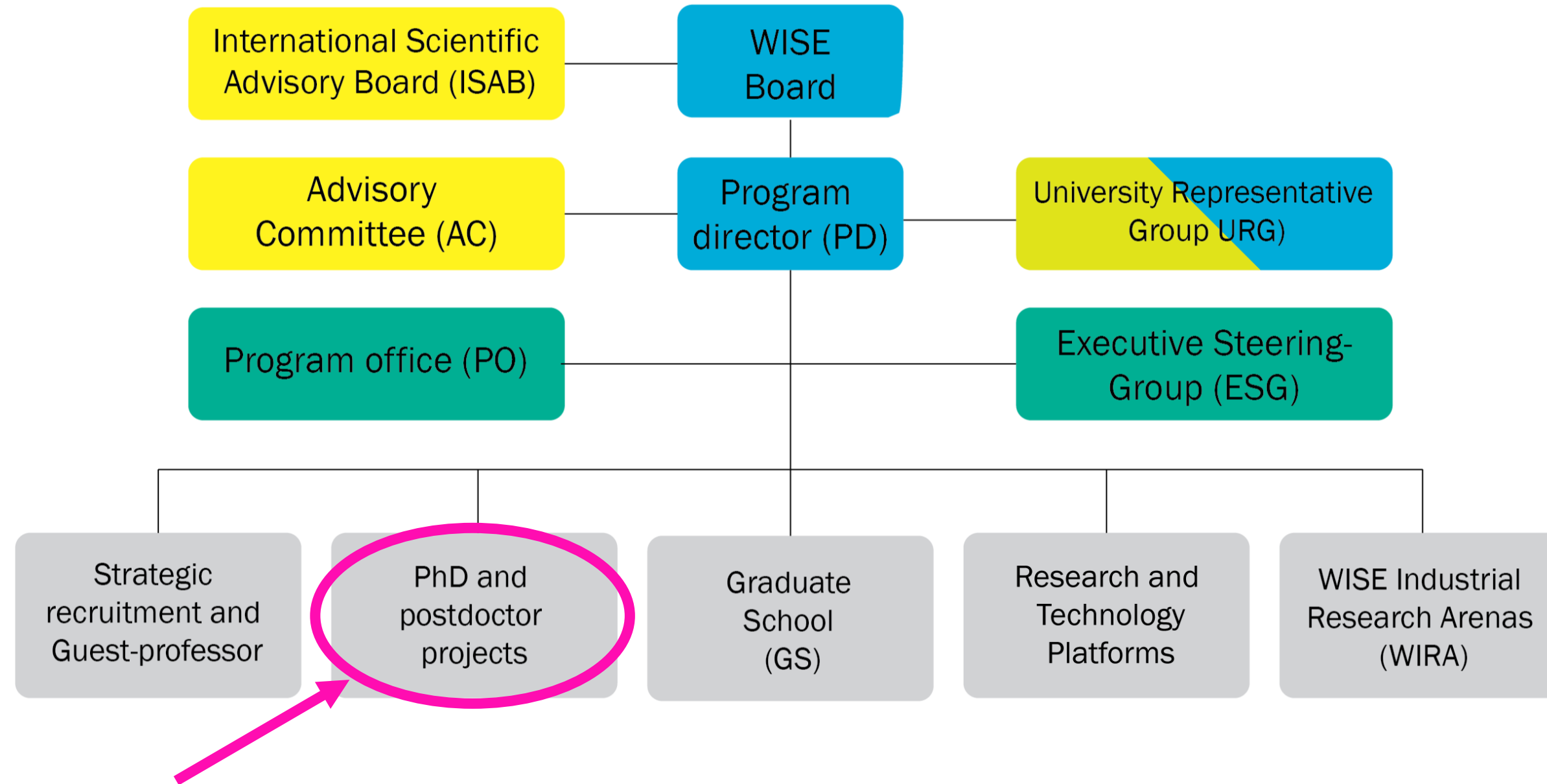
PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

Past, Current and Future Calls (WISE-ap/ip)



wise-materials.org

PARTICIPATING UNIVERSITIES

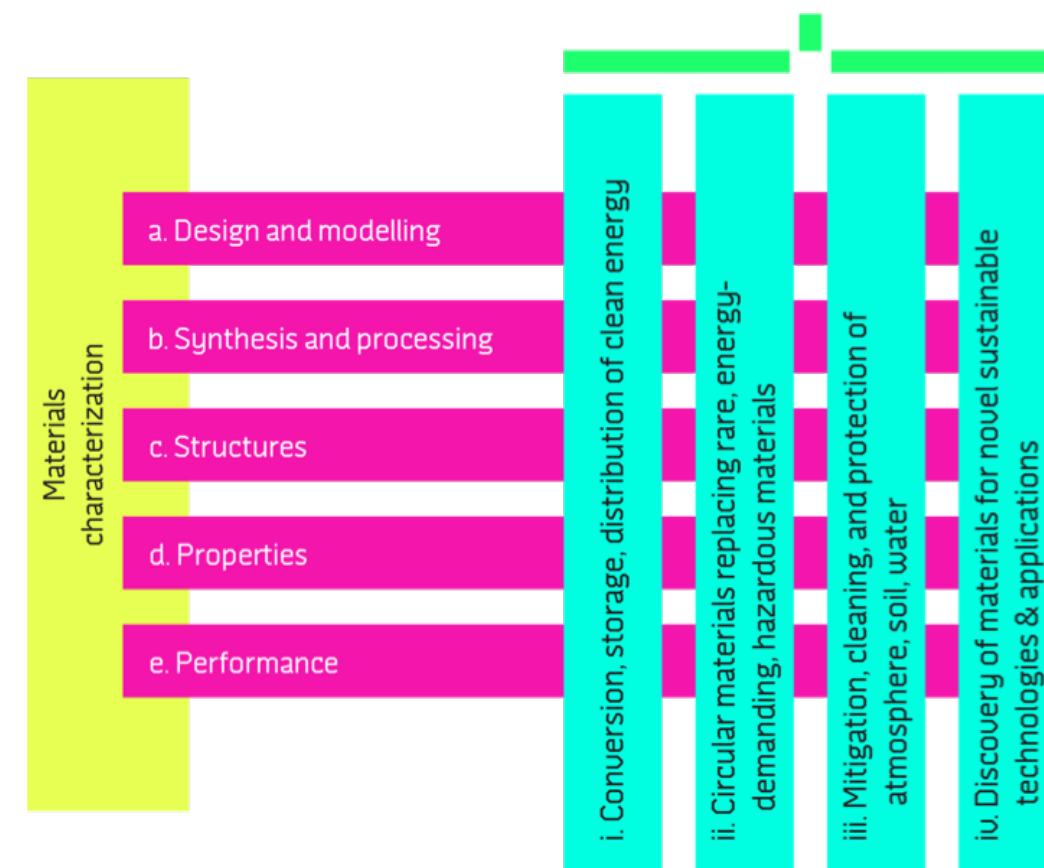


FUNDED BY



Granted WISE- ap1 projects distributed within the WISE matrix

	i) Conversion, storage, distribution of clean energy	ii) Circular materials, replacing rare, energy demanding, hazardous materials	iii) Mitigation, cleaning, and protection of atmosphere, soil, water	iv) Discovery of materials for novel sustainable technologies & applications	Totalt	% av tot
a) Design and modelling	3	2	1	12	18	20%
b) Synthesis and processing	10	8	4	10	32	36%
c) Structures	7	0	3	1	11	12%
d) Properties	8	1	2	3	14	16%
e) Performance	6	3	3	3	15	17%
Totalt	34	14	13	29	90	
% av tot	38%	16%	14%	32%		



0-1	FS
2	FS
3-7	FS
8-9	FS
10-12	FS
	RL

Funding suggested
Reserve list

wise-materials.org

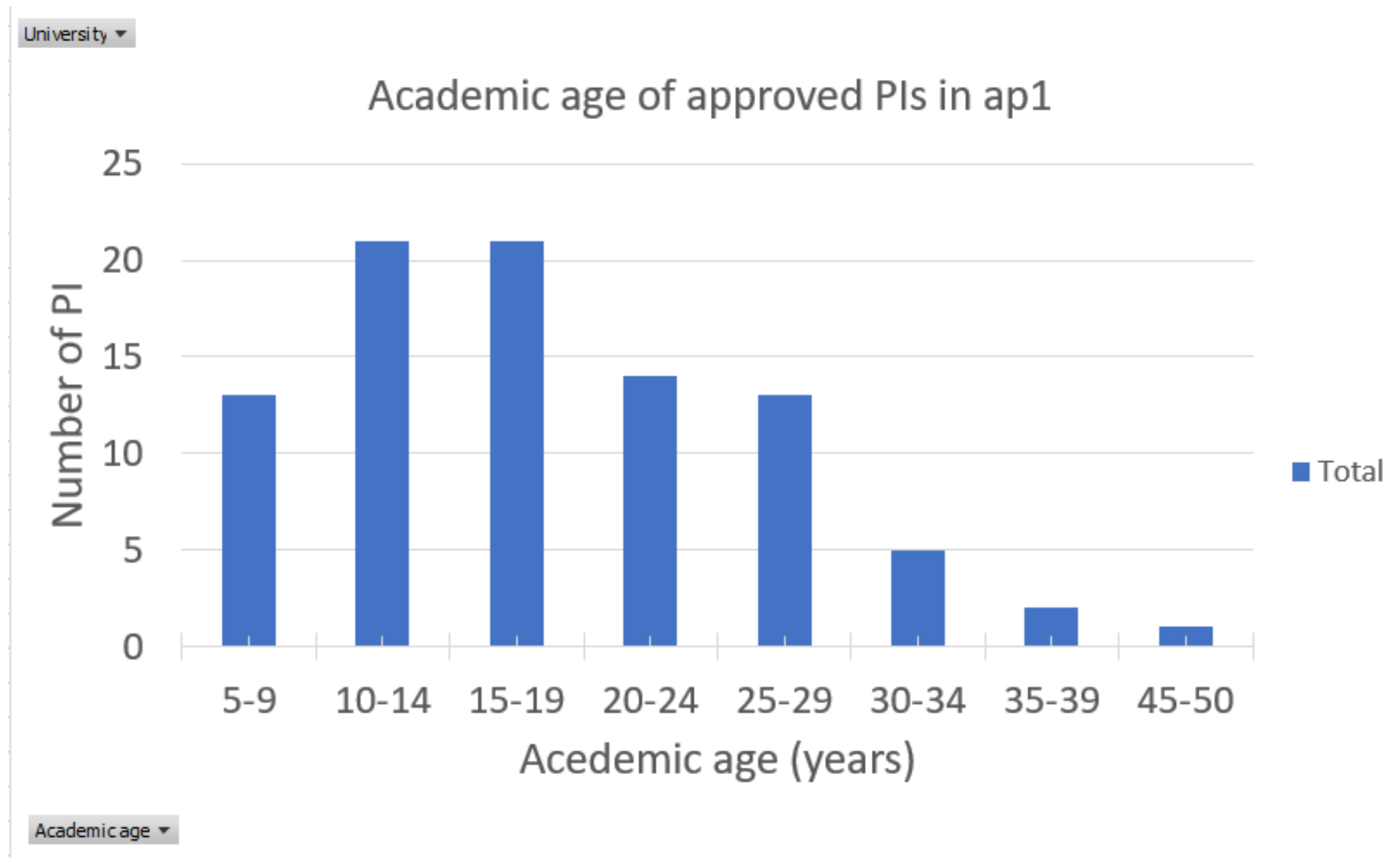
PARTICIPATING UNIVERSITIES



FUNDED BY



WISE-ap1: Distribution of granted PIs over academic age and over universities



Antal av University	Univ	CTH	KAU	KTH	LiU	LTU	LU	SU	UmU	UU	Totalt
F		3	1	4	5	1	5	5		4	28
M		11		9	13	2	7	10	1	9	62
Totalt		14	1	13	18	3	12	15	1	13	90

wise-materials.org

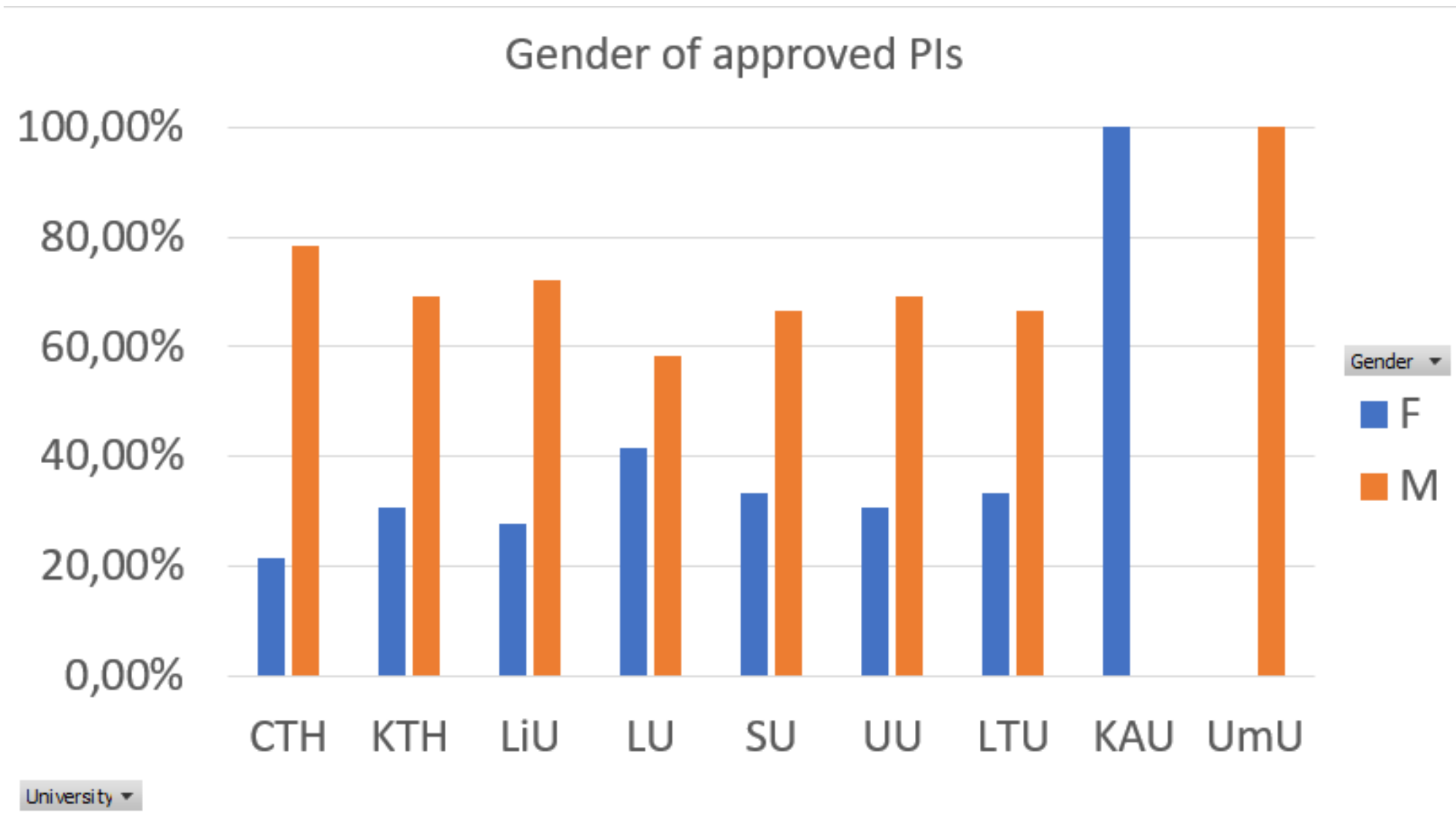
PARTICIPATING UNIVERSITIES



FUNDED BY



WISE-ap1: Distribution of granted PIs over gender



Decision	Female	% F	Male	% M	Total
Funded					
PD	11	25%	33	75%	44
PhD	17	37%	29	63%	46
Total	28	31%	62	69%	90

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY





Wallenberg Initiative
Materials Science
for Sustainability

WISE-ip1: Industrial PhD student and Postdoc Projects

AIM

- Joint industry-academic projects targeting materials science for sustainability
 - Addressing topics in any or several of the thematic areas and research areas of WISE
- Industry, with R&D and operations in Sweden, and a WISE university are invited to apply
 - Industry investigator and academic investigator are both co-applicants
- Twinned industry-academic supervision and project leadership
- The call for projects open on the 1st of April and close on the 30th of April
- Knowledge generated and trained individuals in material science for sustainability. Future leadership and skills for industry, academia and society



Sputtering-based processes for
thin film chalcogenide solar cells
Patrice Bras



wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

Actively participate and develop WISE;

- supervise and foster next generation of leading scientists
- promote research and education
- network across academy and industry on a national and international level, and serve as ambassadors for WISE (incl. acknowledgement and affiliation) *in material science for sustainability*

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

- 28 strategic recruitment packages (Asst/Assoc Prof).
- 186 PhD students (≥ 30 industrial) and 186 postdocs (≥ 30 industrial).
- Guest professors.
- Science and technology platforms.
- Research arenas with industry (WIRAs).
- Operational costs: management, graduate school and collaborations.
- Strategic initiatives.
 - WASP+WISE joint projects, to be launched during 2023-2024



wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

Wallenberg Initiative Materials Science for Sustainability (WISE)

For more information, contact:

Magnus Berggren, Director – magnus.berggren@liu.se

Olle Eriksson, Co-director – olle.eriksson@physics.us.se

Or visit wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

WISE

Wallenberg Initiative Materials Science for Sustainability

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*



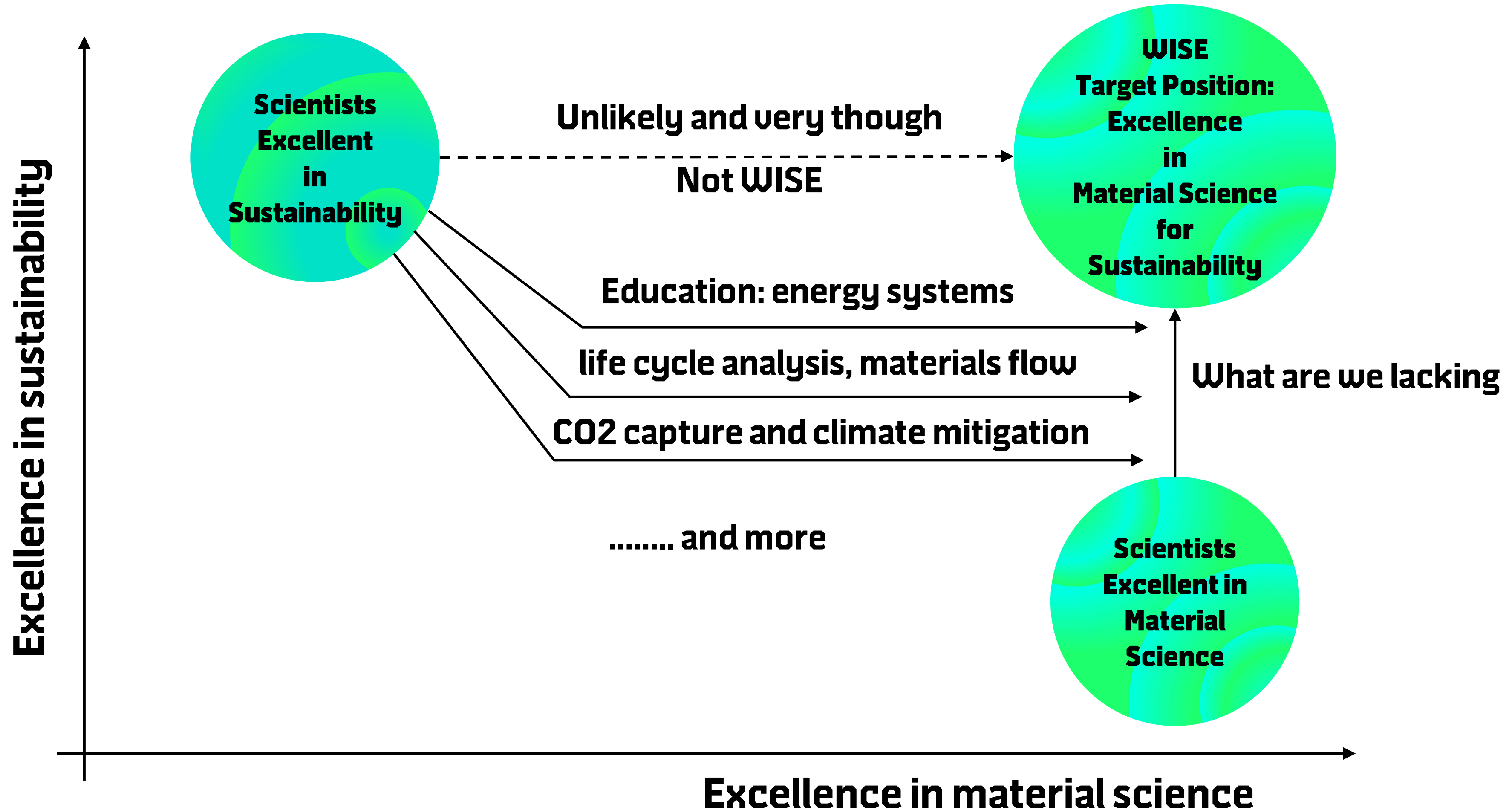
Wallenberg Initiative
Materials Science
for Sustainability

**Materials science
that enables
a sustainable world**



Wallenberg Initiative
Materials Science
for Sustainability





Sustainability education in

- **WISE Dialogue**
- **Seminars**
- **Workshops**
- **Spring/Summer/Fall/Winter Schools**
- **Regular courses**
- **Visits**
- **Collaboration with other initiatives and major centers**
(Carl Folke, Antropocen Laboratory, Beijer Institute, KVA)
- **.....**

Thematic areas

i. Conversion, storage, distribution of clean energy

ii. Circular materials replacing rare, energy-demanding, hazardous materials

iii. Mitigation, cleaning, and protection of atmosphere, soil, water

iv. Discovery of materials for novel sustainable technologies & applications

wise-materials.org

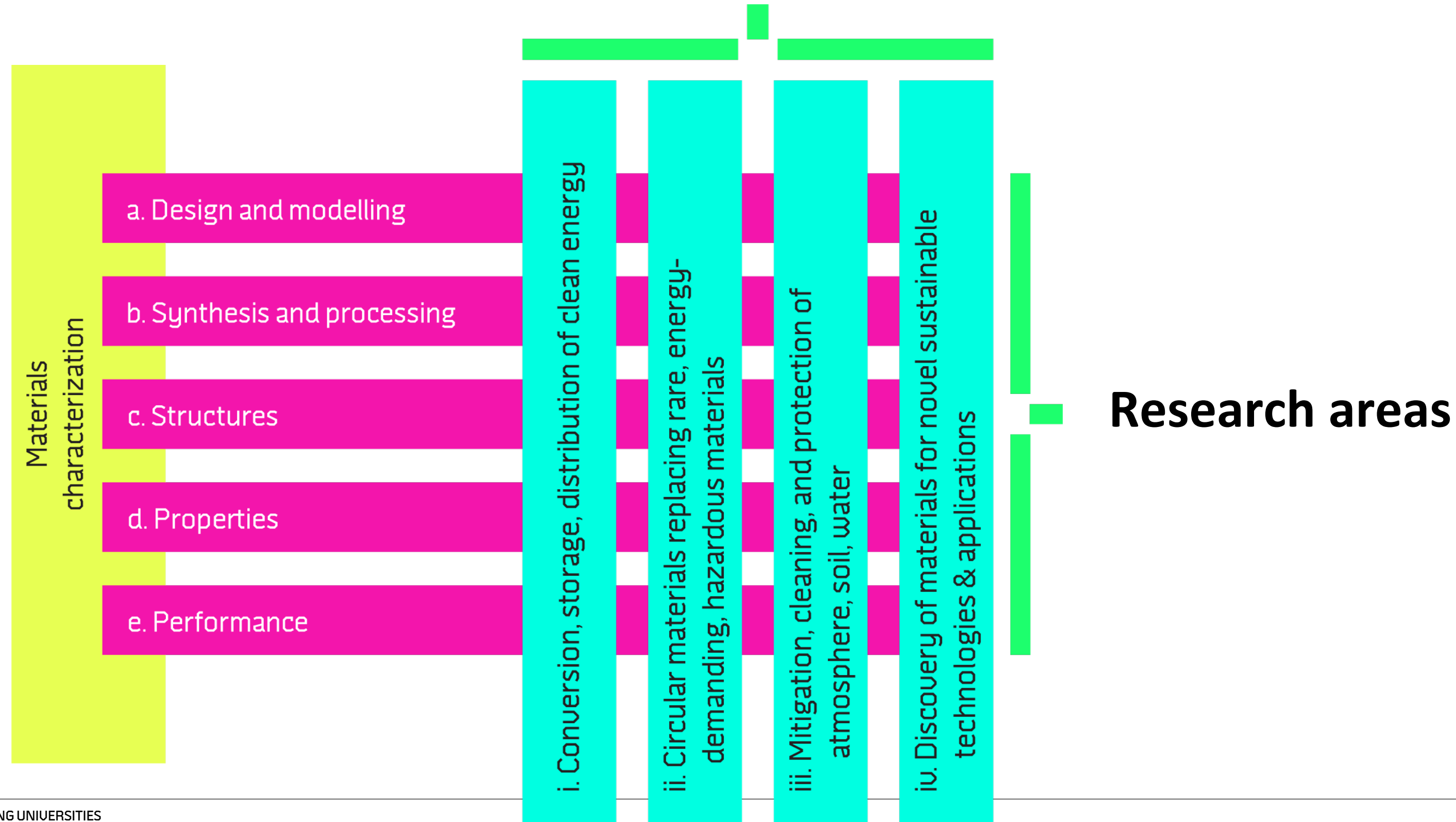
PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*

Thematic areas



wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY



Thematic areas Material science for

- Water
- Agriculture
- ...




Research areas

- AI
- Materials from the forest (WWSC)

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY



So, any thoughts on

- Sustainability
- Future thematic areas
- Future research areas
- Anything?

wise-materials.org

PARTICIPATING UNIVERSITIES



FUNDED BY

*Knut and Alice
Wallenberg
Foundation*