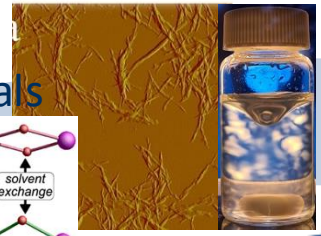
Circulab @ WISE Stockholm University

Aji P Mathew
Department of Materials and Environmental Chemistry

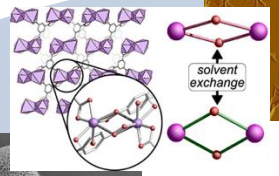
20/09/2024

MMK Research focus areas

Biobased nanomaterials

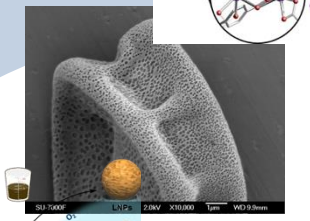


Biochar

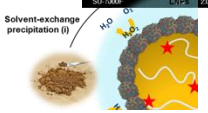


BioMOFs

Porous carbon

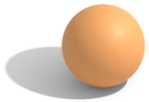


Lignin nanoparticles



Synthesis and processing

Green synthesis / modifications



Organic-Inorganic hybrids and composites

Ionic polymers

Sustainable recycling / upcycling

Sustainable Materials Chemistry

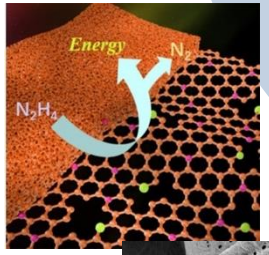
Materials for a sustainable society

Chemical and structural characterisation

Bio based (photo) catalysts

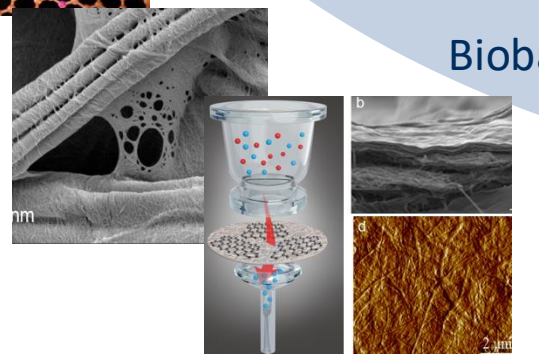
Biomedical scaffolds

Energy materials



Membranes/adsorbents

Antibacterial coatings



Biobased fibers

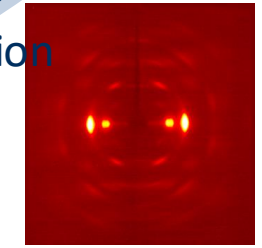
Electron crystallography / X-ray/neutron powder diffraction

Non targetted screening

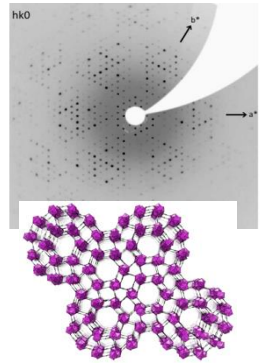
Modelling

Structure determination

Soft Matter Characterisation

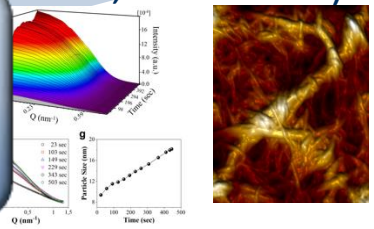


Orientation



Large facilities (MAX IV, Petra III….)

- **SUCCeSS**
- **Circulab**



SUCCeSS

Stockholm University Centre for Circular and Sustainable Systems

- Created in winter 2020-2021
- Start-up funds from the Science Faculty

Stockholm University

SUCCeSS

A center for interdisciplinary research in sustainable and circular systems.

Vision

Lead transformative research and engagement on circular and sustainable systems

Mission

- Provide a stimulating environment for transdisciplinary research on sustainable chemicals & materials
- Identify and address needs for sustainable chemicals & materials in collaboration with policy makers, industries and civil society
- Promote interdisciplinary training in circular and sustainable systems

Stockholm University

SUCCeSS

Research focus areas

- Circular processing
- Sustainable food and water systems
- Data Driven Circular and Sustainable Design

Our Activities

Stockholm University
SUCCeSS

Network building
across disciplines

Seminar series

Joint postdocs

Industry interactions

Contact point at SU for Sustainable and Circular Materials and Chemicals : Research- Policies-Collaborations

Nobel symposium hosted by SUCCeSS

- **Chemistry for Sustainability: Fundamental Advances, May 2025**
- Stay tuned for more information about the satellite events and popular science lectures in connection to the Nobel symposium.

Circulab@ WISE Infrastructure platform

The vision of CircuLab@WISE is to be a world leading facility for rapid development of safe synthesis and processing of circular and sustainable catalytic materials and organic soft matter materials.

The mission of Circulab@WISE is to establish an open platform to:

- Circular and sustainable synthesis, processing and recycling
- Optimise the performance of new catalytic materials for sustainable organic synthesis.
- Real-time characterisation methods to assess emissions, hazardous chemicals and physiochemical changes and potential toxicity of novel materials and their by-products
- Artificial intelligence (AI)-supported analysis and characterization and process optimization.

AI-integrated platform to optimize the synthesis, processing and applications of sustainable materials and **an open hub for academia, start-ups and industries**

Aligns with SUCCeSS Focus Areas

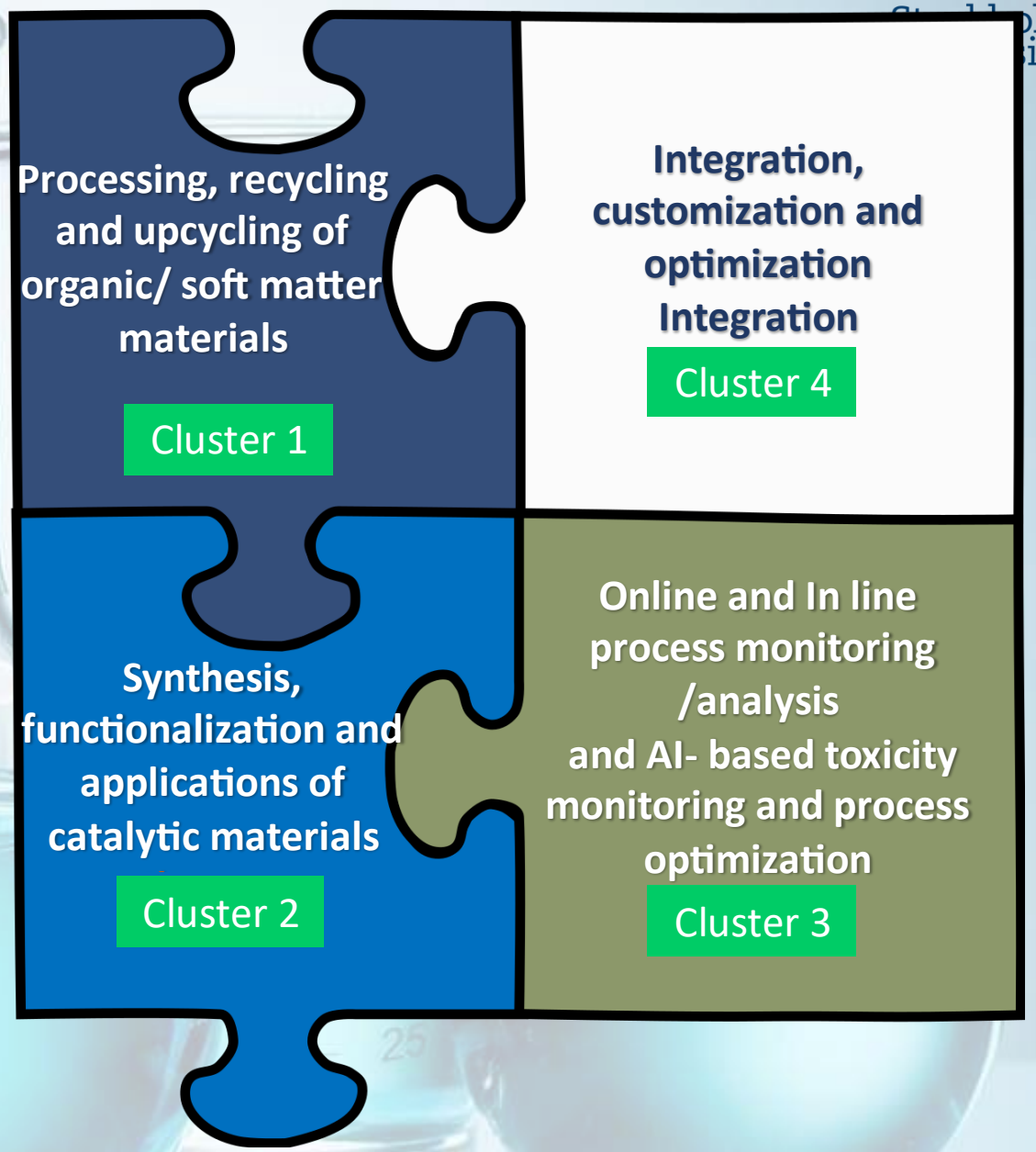
WISE Contribution: 40M SEK (2024-2033)
Co-funded by SU

Scientific Approach

CircuLab@WISE will bring together the expertise and tools from **sustainable chemistry, organic chemistry, materials chemistry, analytical chemistry and machine learning** to build a research environment that leads to the development of safe, circular and sustainable materials for important applications.

People Behind

- Aji Mathew and Belen Martin-Matute (PIs)
- Anneli Kruve
- Berit Olofsson
- Xiaodong Zou
- Joseph Samec
- Mika Sipponen,
- Lennart Bergström
- Jiayin Yuan
- Nicole Pamme
- Oscar Karlsson
- Radovan Krejci
- Miguel Crespo



Circulab @ WISE

- Location: Arrhenius Laboratories
- A hus, 6th Floor, 180 m2

- Procurements ongoing
- Support from Industries and Other Labs (ICL, EPFL)
- Kick off : 2025 end (tentative)


Thank you for your attention
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