Bringing your ideas to life!

Mads Clausen Institute Industry Collaboration

The Mads Clausen Institute (MCI) is a widely renowned partner for companies engaged in technology-driven innovation. We are part of the Faculty of Engineering, University of Southern Denmark, and we are located at campus Sønderborg at the Danish-German border.

We are dedicated to engineering solutions addressing key societal challenges of the 21st century with a focus on climate, smart production, health and innovation. Our research covers topics that range from nanotechnology, mechatronics and electronics as well as upscaling of smart devices to innovation and entrepreneurship.

With more than 50 researchers, we are your gateway to state-of-the-art knowledge, high-tech facilities and creative problem-solving. Get engaged with our reliability, commitment and managed processes, and team up with us to bring your ideas to life!

Our Competences

Our 5 research units provide you with a broad range of state-of-the-art knowledge and experiences.

We have specialised within the following research areas:

NanoSYD

- Nano- and microfabrication
- Organic solar cells
- Organic light emitting devices
- Functional thin films
- Plasmonics and nanophotonics
- Optofluidics and lab-on-chip technology

Mechatronics

- Control systems
- Mathematical modelling
- Embedded software
- Electronics and digital hardware

Nano Optics

- Nanoplasmonics
- Plasmonic metasurfaces

Electrical Engineering

- Power electronics
- Embedded electronics
- Drives and EMC
- Reliability studies

Technology Entrepreneurship and Innovation

- Technology oriented venture-emergence research
- Innovation management from ideation to commercialisation
- Rapid prototyping and product development
- Industry 4.0, digitisation and process development
- Sound design and speech interfaces
- Rhetoric leadership training

Our Approach

With our deep understanding of technology development and innovation processes, we tailor our competences and services to your individual needs and integrate them seamlessly into your R&D activities and innovation stages:

- Ideation
- Product development
- Process development
- Commercialisation

Our Services

Our team offers you a wide range of research and engineering services to accelerate and boost your innovation activities.

We work together within different collaboration schemes such as joint research within our focus areas, contract research or publicly funded projects.

Benefit from our following services which we tailor to your needs:

Research
- Characterisation / analytical services
- Processing services
- Feasibility studies
- Proof of concept
- Prototyping
- Small series production
- R&D projects

Facilities
- Equipment for rent
- Lab area for rent

Consulting
- Innovation consultancy
- Technology consultancy
- Communication consultancy
- Funding advice

Recruiting
- Student internships
- Student projects
- Bachelor and master theses
- PhD projects (academic and industrial)

Ideation
- Creativity workshops
- Idea generation
- Feasibility analysis

Product Development
- Active prototyping
- Materials library
- Product Design

Process Development
- Process optimisation
- Flow mapping
- Supply chain analysis

Commercialisation
- Market analysis
- Business planning
- Entrepreneurship

Our Facilities

We offer high-tech research facilities and equipment. Beyond various standard equipment within our research areas we are proud to provide you with cutting-edge technology.

MCI Cleanroom

The cleanroom is a university-owned facility and part of the centre NanoSYD. We provide expertise to companies within state-of-the-art metrology, test and analytical capabilities as well as prototyping and development.

Examples for application fields:
Surface characterisation, surface structure formation, microfluidics, solar cells, nanomarkers, sensors, nanoparticle generation or laser spectroscopy.

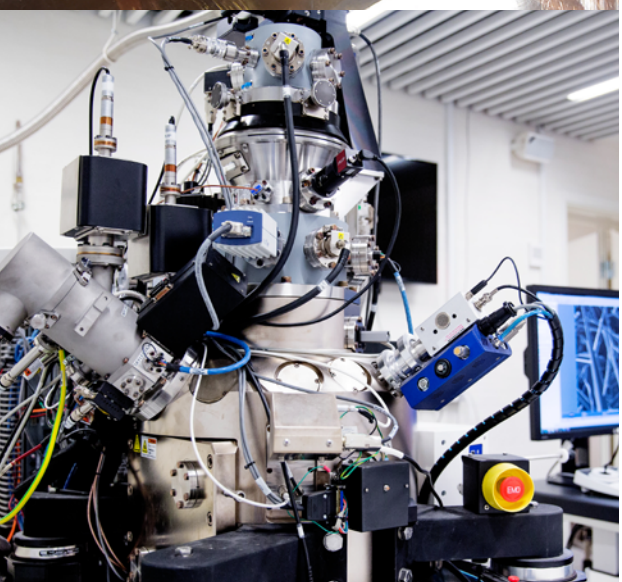
Technical details:
- 110 m^2 white area cleanroom
- 200 m^2 grey area
- ISO5
- 1° temperature control
- 3% relative humidity control
- max. 4'' wafer processing
- Surface science laboratory
- Nano-optics laboratory
- Microscopy laboratory

MCI Roll-to-Roll Print Facility

Roll-to-roll (R2R) processing is the process of printing materials (conducting, semi-conducting, insulating) on thin substrates such as flexible glass or thin plastic foils. The manufactured products include, for example, new flexible electronics, light-emitting diodes or solar cells.

Example for application fields:
Organic solar cells are light-weight, ultrathin and mechanical flexible photovoltaic (PV) cells that also can be made semi-transparent. The cells have the potential to become the new PV technology on the energy market stretching from applications in textiles, mobile units and building integration, where the unique properties of the technology are exploited. The cells can be developed completely from R2R printing technology.

Technical details:
- 150 m^2 R2R print facility
- R2R vacuum sputter deposition for metals and metal-oxides (350 mm web)
- R2R slot-die coating from various solutions (710 mm web)
- R2R lamination/delamination
- Characterisation equipment and much more



MCI ORION Helium Ion NanoFab

The ORION NanoFab Helium Ion microscope is a new advanced instrument for ultra-high (sub nm) resolution imaging and nanofabrication. Its operation is like that of a scanning electron microscope (SEM) but in contrast to SEM, the Orion microscope exploits focused ion beams instead of electron beams, for both image generation and nanostructuring.

Examples for application fields:
Fabrication and imaging of unique nanostructures for photonics, plasmonics, medical and biological sciences. Failure analysis of electronic and microelectronic devices. High-resolution imaging of composite and electrically insulating materials.

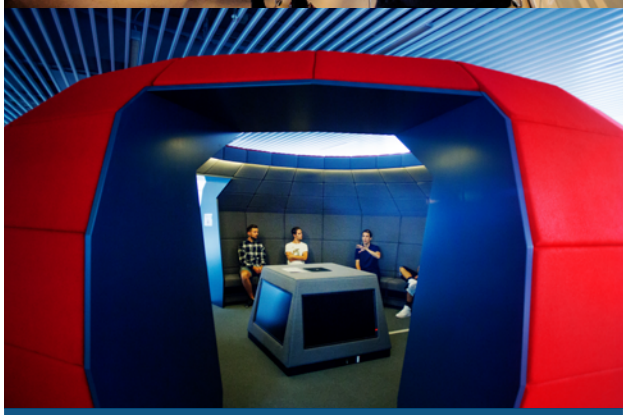
MCI Innovation Lab

The innovation lab is a multi-purpose room that is used for teaching, research and industry collaboration. It reproduces a four-stage innovation process that is applied by established companies in various industries and in technology start-ups.

Examples for application fields:
The innovation lab is connected to all facilities at MCI and can be used to get in touch with state-of-the-art technologies and to meet with both external and internal stakeholders in a new environment.

The innovation stages are:

- Ideation for new ventures and established companies
- Product development and rapid prototyping including design aspects
- Process development with a focus on Industry 4.0 and digitisation
- Commercialisation



Your Way to MCI Research Collaboration

5 **Kick-off for innovation**

4 **Collaboration agreement**

3 **Description of the R&D approach**

2 **Discussions with MCI team of experts**

1 **Contact us for a first dialogue and feedback**

Your Gateway

We are looking forward to discuss potential collaborations. Just get in contact with us!

Horst-Günter Rubahn
Professor, Dr.habil
Director of Mads Clausen Institute
University of Southern Denmark

Phone: +45 6550 4880 (Ms Simurda)
Email: collaborate@mci.sdu.dk

SDU

Learn more about us:
www.sdu.dk/en/mci