NANO-MICRO DEVICES

ADVANCING PRECISION TECHNOLOGIES FOR A BETTER FUTURE

science, technology & innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

CSIR

Touching lives through innovation

ABOUT THE NANO-MICRO DEVICES GROUP

The Nano-Micro Devices Group (NMDG) focuses on developing and fabricating devices and systems at micrometre scales, merging principles from nanotechnology, biotechnology, microelectronics, and manufacturing to achieve precise, functional miniaturization.

The NMDG is host to the Nano-Micro Manufacturing Facility and Lab-on-Chip Node on behalf of the Department of Science Technology and Innovation (DSTI).

REVOLUTIONIZING INDUSTRIES THROUGH NANO-MICRO TECHNOLOGIES

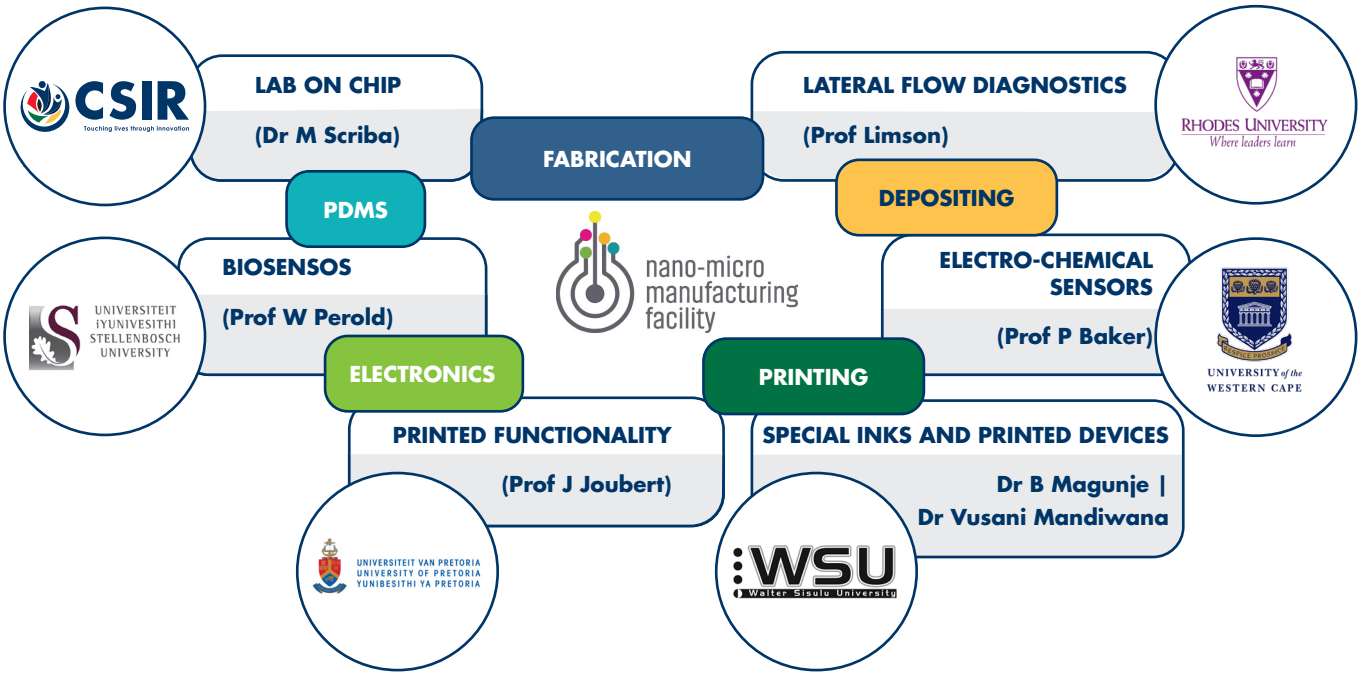
Nano-micro manufacturing technologies offer groundbreaking opportunities across multiple sectors, including:

- **Healthcare** – Developing low-cost diagnostic devices for point-of-care disease detection
- **Agriculture** – Creating biosensors to monitor crop health
- **Industry** – Advancing printed electronics for smart devices and IoT applications
- **Environmental Solutions** – Designing electrochemical sensors for pollution detection

SIX SPECIALIZED NODES OF EXCELLENCE

The NMMF operates through five specialized nodes across South African institutions, each dedicated to a specific research area:

1. **Electrochemical Sensor Node** (University of the Western Cape)
    - Develops electrochemical sensors for environmental monitoring, healthcare diagnostics, and industrial quality control.
2. **Biosensor Node** (University of Stellenbosch)
    - Creates biosensors for rapid, accurate, and affordable medical diagnostics at the point of care.
3. **Paper-Based Lateral Flow Node** (Rhodes University)
    - Specializes in simple yet effective paper-based diagnostic platforms for quick and accessible testing.
4. **Printed Electronics Node** (University of Pretoria)
    - Develops innovative printed electronics with applications in wearables, smart devices, and IoT technologies.
5. **Lab-on-a-Chip (LOC) Node** (Council for Scientific and Industrial Research)
    - Designs miniaturized, integrated lab-on-a-chip systems that revolutionize diagnostics and scientific research.
6. **Special Flexible Printing Node** (Walter Sisulu University)
    - Produces special silicon inks and prints primarily temperature sensing devices.



BRIDGING THE GAP BETWEEN RESEARCH AND REAL-WORLD APPLICATIONS

The primary goal of the NMMF is to transition innovative research into real-world applications. By offering state-of-the-art facilities, advanced equipment, and expert guidance, NMMF enables researchers to move their technologies to the next Technology Readiness Level (TRL), ensuring impactful, practical solutions.

COLLABORATION OPPORTUNITIES

Collaboration is at the heart of the NMMF. The facility encourages partnerships between researchers, industry leaders, and academic institutions to foster interdisciplinary innovation. Researchers can leverage the strengths of each specialized node, enhancing their development processes and commercialization potential.

While the facility is funded by the DSTI and welcomes South African researchers, students, and engineers, a fee may be applicable for consumables and specific instrument usage.

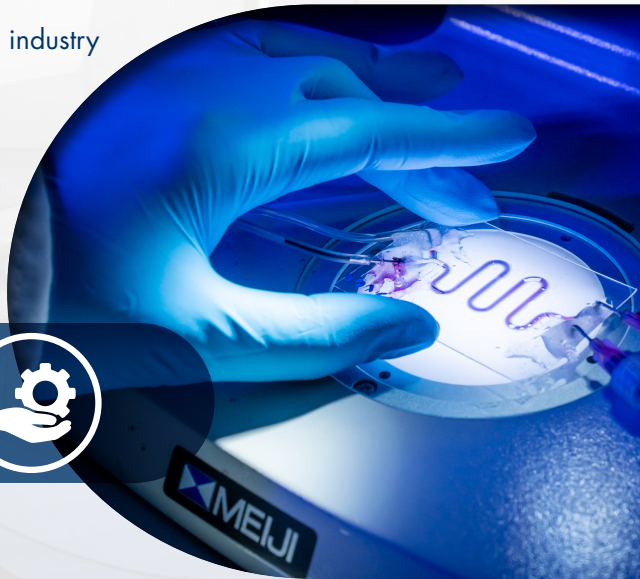
IMPACT ON SOCIETY

The NMMF is driving technological innovation in South Africa, contributing to:

- **Improved healthcare solutions** through rapid diagnostics
- **Sustainable industrial and environmental advancements**
- **Economic growth** by supporting emerging technology industries
- **Strengthening South Africa's position** in global technological innovation

GET INVOLVED

The **NMMF operates on an open-access basis** and supports both industry and academia **nationally**.



IF YOU ARE INTERESTED IN USING THE FACILITY OR COLLABORATING ON A PROJECT, CONTACT:

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JOIN US IN PUSHING THE BOUNDARIES OF NANO-MICRO MANUFACTURING FOR A MORE INNOVATIVE AND SUSTAINABLE FUTURE!