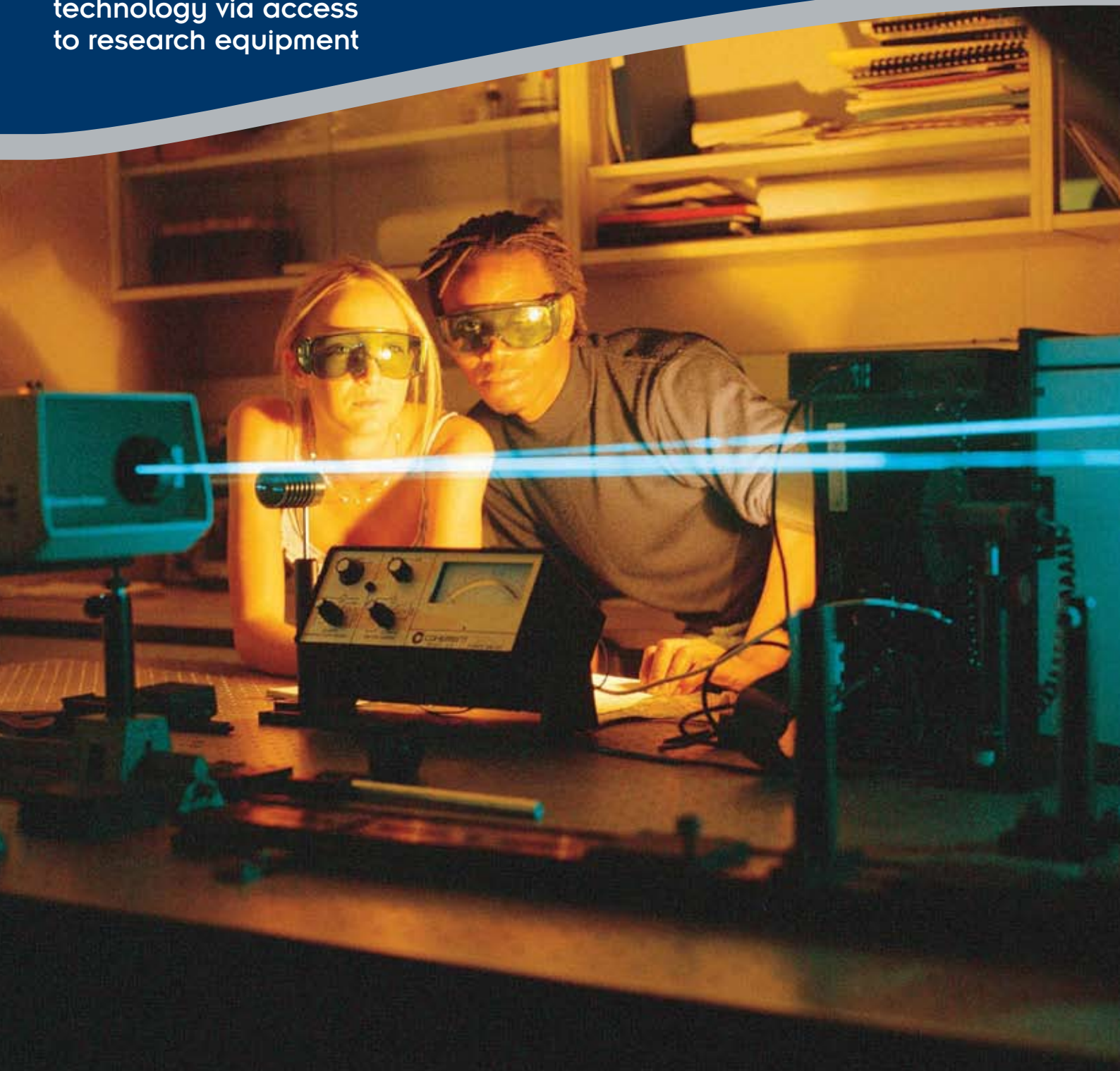


# Focus on Lasers

## Rental pool programme

Advancing laser  
technology via access  
to research equipment



The CSIR National Laser Centre in Pretoria manages a laser rental pool programme (RPP) that provides researchers at tertiary education institutions (TEIs) the opportunity of engaging in laser-based research using a collection of state-of-the-art lasers and laser diagnostic equipment. The programme also provides much needed scientific and technical expertise to participating TEIs.

In order to grow and build laser research capacity, the RPP provides participating TEIs access to highly-equipped laser laboratories at the centre. The sharing of costly high-tech laser equipment situated centrally implies significant cost-savings while strengthening the laser scientific community.

### One goal: Stimulating local laser research

The sole purpose of the laser RPP is to develop laser research programmes, specifically within the

context of TEIs - where the country's future researchers reside. As a result, world-class scientific human capital is developed in support of efforts to enhance skilled human resources in science, engineering and technology.

Laser research is a cross-cutting discipline ranging from physics, engineering, chemistry, nanotechnology, agriculture, biotechnology, cancer, clinical medicine, dentistry, drug discovery, genetics, immunology, molecular biology, neuroscience, microbiology, pharmacology, physiotherapy, pathology to somatology and metrology.

The grants cover the preparation and upgrade of equipment; delivery, set-up and return charges; accommodation and travel costs; maintenance costs, insurance costs, provision for replacement; consultation and external services; procurement of new equipment; and consumables.

A peer-review panel evaluates the scientific and technical content of the applications and ensures that projects are aligned to national priorities. The review panel comprises international and national experts from TEIs and industry.

The Department of Science and Technology (DST) has made funds available to the CSIR to manage the Laser Rental Pool Programme.



### Equipment

The following is available via the RPP:

- Excimer system
- Dye systems
- Nd:YAG systems
- CW CO<sub>2</sub> systems
- Pulsed CO<sub>2</sub> systems
- Pulsed laser deposition (PLD) systems
- Laser induced plasma spectroscopy (LIPS) system
- High resolution fourier transform spectroscopy (FTIR)
- Surface characterising facility
- Femtosecond laser
- 5kw CO<sub>2</sub> laser system
- 4kw Nd:YAG laser system.





## Research and equipment at the CSIR National Laser Centre user facility

### Pulsed laser deposition (PLD) system

- Ablation of nanomaterials, thin films and semiconductors
- Deposit single and multi-layer coatings
- Annealing thin films up to 800 °C (oxygen, argon and nitrogen gases).

### FTIR spectrometer

- Analyse solids, powder and liquids
- High resolution infrared spectrometer (0,013 cm<sup>-1</sup>)
- Can do reflectance, transmittance and absorbance measurements.

### Zygo Interferometer

- Surface characterisation of optics (e.g. surface roughness, radius of curvature)
- Can accommodate most optical elements and materials with reflective surfaces.

### Laser induced fluorescence (LIF)

- Study of PAHs and other environmental compounds.

### Laser Induced Plasma Spectroscopy (LIPS)

- Analyse trace quantities of elements in a sample (e.g. bones).

### Time of Flight Mass Spectroscopy (TOF-MS)

- Laser ionisation studies.

### Nd:YAG and OPPO laser

- High power Nd:YAG laser
- Wavelength range from 400 nm to 2200 nm
- High-voltage plasma studies/ research.

## Going about it

General information as well as an application form is available on [www.csir.co.za/lasers](http://www.csir.co.za/lasers).

The CSIR will provide guidance and will also advise on the suitability of equipment.

## Other collaborative opportunities

The CSIR National Laser Centre conducts research in collaboration with TEIs, others science councils and industry in the following areas:

- Biophotonics
- Laser materials processing
- Ultra-short physics spectroscopy
- Laser sources
- Mathematical optics
- Lidar
- Photonic materials.

## Conditions

The CSIR limits the use of the fund to projects involving master's, doctoral and postdoctoral students; in line with the DST policy of equity and redress. In select cases, honours studies also qualify.

Awarded projects must submit summary progress reports to the CSIR National Laser Centre bi-annually, with detailed progress and status reports at year end. In the case of concluded projects, detailed reports must be submitted one month after completion.



## Contact details:

CSIR National Laser Centre

Dr Paul Motalane  
Tel: +27 12 841 3131

Thomas du Plooy  
Tel: +27 12 841 3511  
Email: [NLCRentalpool@csir.co.za](mailto:NLCRentalpool@csir.co.za) or  
[NLInfo@csir.co.za](mailto:NLInfo@csir.co.za)

[www.csir.co.za](http://www.csir.co.za)