



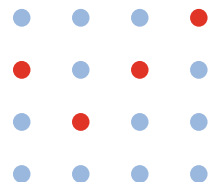
**NITheCS**

National Institute for  
Theoretical and Computational Sciences

April 2026 



**NEWSLETTER**



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# Prof Francesco Petruccione

Dear NITheCS Community

April promises to be another exciting month for the NITheCS community. We look forward to celebrating World Quantum Day on 14 April with a special talk by Maria Schuld (Xanadu), alongside the launch of the Quantum Africa Society – an important milestone for advancing quantum science on the continent. In line with this theme, this newsletter features a recent publication co-authored by NITheCS Associate Eric Maluta.

A reminder that the call for nominations for new NITheCS Associates for 2026 is open. Nominations may be submitted by current Associates only, and we encourage you to put forward eligible colleagues. The closing date is 30 June.

We extend our sincere thanks to all Associates who contributed research topics to the NITheCS Winter Internship Programme, taking place over three weeks during the June/July 2026 holidays. Students applied by 7 April and were able to choose from more than 50 topics. We will engage shortly with supervisors to finalise intern selections.

This month, we will also launch the NITheCS heat of FameLab, inviting science students, researchers, and early-career scientists to present a scientific concept in just three minutes. We look forward to welcoming enthusiastic and creative participants.

We are pleased to include a range of local and international funding opportunities in this newsletter, supporting members of our community in advancing their studies, research and other activities.

Please visit our website, follow us on social media, and keep an eye on our email communications for [upcoming events](#).

Here's to a month of meaningful work and fresh inspiration.

Best regards

Prof Francesco Petruccione

## Nominations open for new NITheCS Associates

NITheCS invites nominations for new Associates.

**Only current NITheCS Associates may nominate eligible candidates, who must:**

hold a PhD in a NITheCS discipline and occupy an academic position at a recognised South African institution. Please submit your nominations, supported by at least two additional NITheCS Associates, via our [online form](#) (accessible when **signed in to Google with your NITheCS email account**). Required documents include:

a brief motivation, the candidate's comprehensive CV (with publication list), and a statement outlining their research vision and intended contributions to NITheCS. An independent evaluation committee will review the nominations. The closing date is 30 June 2026.

[MORE INFO](#)

# Upcoming events



## NITheCS Colloquium 'Modelling deformation in biological cells'

Dr Rhoda Hawkins (AIMS Ghana & University of Sheffield, UK)  
Mon, 13 April 2026 | 16h00-17h00 SAST

### Venues:

- Stellenbosch University: Road House Cinema (Neelsie)
- University of the Witwatersrand: Room P215, 2nd Floor, Physics Building
- North-West University: Seminar room K310, Physics Building G5
- Online

[POSTER](#)

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## World Quantum Day celebration:

NITheCS Public Talk and launch of the Quantum Africa Society  
'Why is it so hard to know what quantum computers are good for?'

Dr Maria Schuld  
Tues, 14 April 2026 | 16h00-17h00 SAST

### Venues:

- Road House Cinema at the Neelsie, Stellenbosch University, other in-person venues,
- and online

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## NITheCS Mini-school 'Introduction to Machine Learning'

Prof Najmeh Nakhaeirad (University of Pretoria)  
and Dr Kabelo Mahloromela (University of Pretoria)  
Wed, 8, 15, 22 & 29 April 2026 | 14h00-15h00 SAST

### Venues:

- Online

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## NITheCS Colloquium

### 'On the quest for reliable measurements of Cosmic Dawn'

Dr Steven Murray (Stellenbosch University)

Mon, 20 April 2026 | 16h00-17h00 SAST

#### Venues:

- Stellenbosch University: Road House Cinema
- University of the Witwatersrand: Room P215, 2nd Floor, Physics Building
- North-West University: Seminar room K310, Physics Building G5
- Online

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## NITheCS & SU Dept. of Statistics & Actuarial Science Seminar

### 'A brief history of US options trading and the implications for today'

Prof Robert Webb (University of Virginia, Charlottesville, US)

Thurs, 23 April 2026 | 13h00-14h00 SAST

#### Venues:

- Room 1011, Van der Sterr Building, c/o Victoria & Bosman Streets, Stellenbosch
- and online

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## NITheCS & SU Dept. of Statistics & Actuarial Science Seminar

### 'Bayesian study on tumour burden using functional uniform priors in nonlinear mixed-effects models'

Mia Meyer (Stellenbosch University)

Fri, 24 April 2026 | 13h10-14h10 SAST

#### Venues:

- Room 2048, Van der Sterr Building, c/o Victoria & Bosman Streets, Stellenbosch,
- and online

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## NITheCS Colloquium

### 'Africa's electric motorbike future can be built locally and powered by solar (our 6,000km ride shows what's possible)'

Prof Thinus Booysen (Stellenbosch University)

& Dr Stephan Lacock (Stellenbosch University)

Mon, 25 May 2026 | 16h00-17h00 SAST

#### Venues:

- Stellenbosch University: Road House Cinema
- University of the Witwatersrand: Room P215, 2nd Floor, Physics Building
- North-West University: Seminar room K310, Physics Building G5
- Online

[POSTER](#)

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## 9th Biennial African School of Fundamental Physics and Applications (ASP2026)

5-19 July 2026

### Venues:

- University of Nairobi, Kenya

[MORE INFO](#)



## NITheCS & UWC Public Talk 'Astroseismology: The Real Music of the Spheres'

Prof Donald Kurtz (North-West University)

Wed, 15 July 2026

### Venues:

- Road House Cinema at the Neelsie, Stellenbosch University,
- and online

[POSTER](#) | [MORE INFO](#) | [REGISTER](#)



## 47th South African Institute of Computer Scientists and Information Technologists (SAICSIT) Conference

13-15 July 2026

### Venues:

- UCT Graduate School of Business Conference Centre: 9 Portswood Rd, V & A Waterfront, Cape Town

[MORE INFO](#)



## 10th International Conference on Quantum Techniques in Machine Learning (QTML2026) 'Bridging Quantum Computing and Machine Learning'

6-11 December 2026

### Venues:

- Jan Mouton Learning Centre, Stellenbosch University

[MORE INFO](#)



## Missed an Event?

Want to rewatch an event?

- [Visit our website](#) for details of past events.
- Watch recorded talks on the [NITheCS YouTube channel](#).
- To inform us of an event that may interest the NITheCS community, [upload your content HERE](#).



## External events

### Abdus Salam International Centre for Theoretical Physics (ICTP), Italy

View events in the [ICTP Scientific Calendar](#).

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#### UCT CTMP talks

Jeff Murugan (University of Cape Town)

Talk 2: 'Semiclassical Operator Dynamics'

**Date:** Fri, 17 April 2026 | 14h00–15h00 SAST

**Venues:** Duncan Elliott Seminar Room, University of Cape Town and Zoom

**ZOOM LINK** (Meeting ID: 611 6673 7826 | Passcode: 559734)

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#### MFC CDT Summer School

'Uncertainty Quantification for Climate'

**Date:** 2–5 June 2026

**Venues:** Online via Zoom, with possible hybrid sessions on 5 June

**MORE INFO** | **REGISTER** (by 27 May 2026)

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#### International Conference on Mathematical Models and Methods in Biosciences (Biomath)

**Date:** 14–19 June 2026

**Venues:** Bolyai Institute, Szeged, Hungary

**MORE INFO**

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#### African Data Science Conference 2026 (ADSC 2026)

**Date:** 24–26 June 2026

**Venues:** University of the Witwatersrand

**MORE INFO**

## American Institute of Mathematical Sciences (AIMS)

15th AIMS Conference

**Date:** 6–10 July 2026

**Venues:** Athens, Greece

[MORE INFO](#) | [REGISTER](#)

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## UWC Department of Physics and Astronomy Conference

'Photometric Surveys of Southern Stars'

**Date:** 12–17 July 2026

**Venues:** Stias, Stellenbosch

[MORE INFO](#) | [REGISTER](#)

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## International Space Summit Africa

'Photometric Surveys of Southern Stars'

**Date:** 10–12 August 2026

**Venues:** CSIR International Convention Centre, Pretoria

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## 24th International Conference of Numerical Analysis and Applied Mathematics

**Date:** 15–21 September 2026

**Venues:** Galaxy Hotel, Heraklion, Crete, Greece

[MORE INFO](#)

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## Functional Analysis and Operator Theory South Africa Workshop (FAOTSA 2026)

**Date:** 28 October – 1 November 2026

**Venues:** North-West University, Potchefstroom

[MORE INFO](#) | [REGISTER](#) (from 20 Jul – 4 Oct)

# Courses



## Our FREE Courses for 2026:

Computational Infodemiology **Rescheduled to:** 15 & 22 April; plus 20 & 27 May (15h00 – 17h00)

Introduction to Pointfree Topology 18 May – 18 July 2026

Introduction to String Theory 1 July – 1 December 2026

Advanced Partial Differential Equations 27 July – 27 October 2026

Quantum Field Theory I 27 July – 27 October 2026

Riemann Surfaces 31 July – 23 October 2026

[MORE INFO](#) | [DOWNLOAD A POSTER](#)

# Join the ADEQUATE course: free, online, hands-on.

50+ hours of beginner-friendly quantum programming with Qiskit & PennyLane.  
No prior experience in quantum physics required.

Enrol now  
and earn  
your  
certificate.

Apply  
quantum  
algorithms on  
real hardware.

Learn  
Quantum.  
No Physics  
Needed.



## ADEQUATE



Funded by the  
European Union



## Learn quantum the hands-on way!

Join the ADEQUATE course, a free 50-hour online programme developed by QURECA and QWORLD and funded by the EIT Deep Tech Talent Initiative. Designed for beginners with Python skills, this hands-on training will guide you through the foundations of quantum computing, quantum algorithms, and real hardware applications - no physics background needed.

[MORE INFO](#)

## Featured scientist

### Prof Sonali Das

Prof Sonali Das is a statistician and interdisciplinary researcher at the University of Pretoria whose research is at the intersection of climate, business, and data science. Her research explores how climate-induced stressors shape decision-making, and how statistical methods can be used to better understand complex systems linking environment, society, and technology.

[READ MORE](#)

To view the most recent publications by NITheCS Associates, staff, postdoc researchers and students who included their NITheCS affiliation on their publications, [please click here](#).

Additionally, articles and publications with a NITheCS affiliation can be viewed on [Nature Index](#).

## Featured article:

### SPRINGER NATURE Link

Home > Journal of Electronic Materials > Article

## Structural, Mechanical, Optoelectronic and Thermoelectric Properties of NaYSe<sub>2</sub>: DFT Insights

Original Research Article | Published: 12 November 2025  
Volume 55, pages 854–865, (2026) [Cite this article](#)

[Elkana Rugut](#) , [Eric Maluta](#) & [George Amolo](#)

### ABSTRACT:

This study investigates the structural, mechanical, vibrational, electronic, optical, lattice thermal conductivity, transport, and thermoelectric properties of sodium yttrium selenide (NaYSe) in the trigonal structure using a first-principles approach. The lattice dynamics, thermal conductivity, and cumulative group velocity and phonon lifetimes were determined by solving the phonon Boltzmann equations, where a low value of lattice thermal conductivity of about 1.25 W/m·K was obtained at room temperature. The optical properties including dielectric function, refractive index, absorption coefficient, extinction coefficient, reflectivity, and energy loss are discussed. This material shows lattice, transport, and optical anisotropism, since the numerical values of the stated descriptors are comparable in the x- and y-axis, whereas the z-axis values are different, attributed to its trigonal symmetry; hence, for simplicity, we present the averaged data. This ternary compound has remarkable dimensionless figure of merit (zT) values of about 2.27 and 2.30 at 1000 K for holes and electrons, respectively, as supported by the lattice, transport, and thermoelectric data, making it a strong contender for high-temperature thermoelectric applications. To the best of our understanding, until now, there has been no scientific report about vibrational, lattice thermal conductivity, transport, and thermoelectric properties of sodium yttrium selenide. This work contributes immensely towards the discovery of new materials that possess higher zT values, in order to realize more efficient thermoelectric systems.

[READ MORE](#)



## Wisaarkhu: a global community

The Wisaarkhu community seeks to reveal the beauty and power of mathematics and the basic sciences, and how they provide a real edge in practical applications – from modelling ecosystems to applying physics, chemistry, and computer science to real-world challenges.

Join Wisaarkhu on this journey of discovery and unlock the possibilities of the basic sciences.

By supporting and sharing the community, you help make science and mathematics accessible and inspiring for all.

[VISIT THE SITE](#)



## Illustration by Nino Mekanarishvili:





# Student opportunities

## International scholarships – various

View scholarship opportunities from China, Erasmus +, Intra-Africa, Ireland, France, Germany and the United Kingdom.

[MORE INFO](#)

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## MSc Position in Experimental Optical Quantum Computing at Stellenbosch University (1-2 years)

**Application deadline:** 15 April 2026 (rolling applications)

Applications are invited for an MSc position in experimental optical quantum computing at Stellenbosch University. This opportunity involves working within an international, industry-linked collaboration exploring photonics-based quantum computing systems. Candidates should have a strong background in physics, programming skills (preferably Python), and some experimental experience in optics. A full bursary is available, renewable for a second year.

[MORE INFO](#)

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## Australia Awards Africa Scholarships 2027

**Application deadline:** 30 April 2026 (06h00 SAST)

Applications are open for the 2027 Australia Awards Africa scholarships, offering eligible African candidates the opportunity to pursue a Master's degree in Australia. The programme aims to develop future leaders in priority areas such as agriculture, climate change, energy, and social inclusion. Applicants must meet eligibility criteria, including relevant work experience and an undergraduate degree.

[MORE INFO](#)

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## CoE-MaSS Postdoctoral Fellowships: Deadline Extended

**Extended application deadline:** 30 April 2026

The CoE-MaSS invites applications for two Postdoctoral Fellowships, open to South African citizens only. Applicants must have obtained their PhD within the past five years (after July 2021), be under the age of 38, and undertake research aligned with CoE-MaSS focus areas at a participating South African institution. Applicants may not remain with their same PhD supervisor.

**Fellowships must commence by 1 July 2026.**

[MORE INFO](#)

## Google PhD Fellowship Programme 2026

**Application deadline:** 1 May 2026 at (01h59 SAST)

Applications are open for the Google PhD Fellowship Programme, which recognises and supports outstanding graduate students conducting innovative research in computer science and related fields. Open to PhD candidates worldwide (via university nomination), the programme focuses on areas such as machine learning, quantum computing, systems, and human-computer interaction.

[MORE INFO](#)

## Postdoctoral Fellowships – MIND Institute, University of the Witwatersrand (WITS)

**Application deadline:** Open until fellowships are filled

The Machine Intelligence and Neural Discovery (MIND) Institute at WITS invites expressions of interest from outstanding early-career researchers for Postdoctoral Fellowships in the areas of Embodied AI & Reinforcement Learning, African AI Governance, Ethics and Leadership, and Artificial Intelligence and Procedural Content Generation.

[MORE INFO](#)

To share opportunities with the NITheCS community, [CLICK to upload your content.](#)



**Grants/Funding**

### External funding

External funding is available for research, conferences, travel, collaborative grants and postdoctoral fellowships.

[MORE INFO](#)

## NRF – FirstRand Empowerment Foundation: Black Academics Advancement Programme

**Application deadline:** 15 April 2026

Two tracks are available:

- PhD Track
- Post-PhD Track

For details, please refer to the [Framework Document](#) and [Application Guide](#).

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## Marie Skłodowska-Curie Actions (MSCA) Staff Exchanges 2026

**Application deadline:** 16 April 2026

The European Commission will award €97.9 million to promote international, inter-sectoral and interdisciplinary collaboration in research and innovation by enabling staff exchanges and the sharing of knowledge across all stages of the innovation chain.

[MORE INFO](#)

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## Global Researcher Short Visits in AI in Science Capacity Building – Imperial College London

**Application deadline:** 24 April 2026

Applications are open for short-term research visits at Imperial College London under the CNRS–Imperial International Research Centre. This programme supports researchers from South Africa and other Global South countries working at the intersection of AI and the sciences, offering one-month visits to foster collaboration, skills development, and long-term partnerships.

[MORE INFO](#)

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## SASUF AIMday 2026 and Follow-up Funding Opportunities

**Application deadline:** 24 April 2026

The SASUF AIMday 2026, taking place on 26 May 2026, offers a virtual platform for collaboration between academia, industry, government, and civil society to address real-world challenges through structured, one-hour dialogue sessions. Participation can lead to concrete research and innovation partnerships, with opportunities to develop ideas into funded projects. Follow-up funding includes the SASUF–NRF Seed Grants (2026–2028) and Local AIMday Grants, supporting interdisciplinary collaboration and stakeholder engagement across South Africa and Sweden.

[MORE INFO](#)

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## Team Finland Knowledge Programme: 2026 Call

**Application deadline:** 27 April 2026

The Team Finland Knowledge (TFK) programme invites applications to support educational cooperation between Finnish higher education institutions and partners in regions including Southern Africa. Funding is available for joint teaching, curriculum development, mobility, and collaborative projects across all disciplines and degree levels. Projects run from August 2026 to December 2028, with up to €80,000 available per project.

[MORE INFO](#) | [PRESENTATION](#)

## ICIAM Conference Support for Developing Countries

**Application deadline:** 30 April and 31 October each year

- The International Council for Industrial and Applied Mathematics (ICIAM) offers limited
- funding to support participation from developing countries at conferences, workshops,
- and research schools in applied and industrial mathematics. Up to USD 3,500 per event
- is available to provide fellowships for selected participants. Organisers may submit
- applications at least a year in advance of the event.

[MORE INFO](#)

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## L'Oréal–UNESCO For Women in Science Sub-Saharan Africa Programme 2026

**Application deadline:** 15 May 2026

This programme supports outstanding women researchers across Sub-Saharan Africa in the fields of Formal & Life Sciences, Environmental & Physical Sciences, and Engineering & Technological Sciences. Awards include research grants of €10,000 for doctoral candidates and €15,000 for postdoctoral researchers, along with leadership training.

[MORE INFO](#)

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## FWO–NRF Joint Call for Collaborative Research Projects (2027–2029)

**Application deadline:** 26 May 2026 (17:00 SAST)

**NRF institutional deadline:** 1 June 2026

The Research Foundation – Flanders (FWO) in Belgium and South Africa's National Research Foundation (NRF) invite applications for joint research projects across all scientific disciplines. Up to six three-year projects (2027–2029) will be funded, each led by principal investigators from Flanders and South Africa.

[MORE INFO](#)

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## NGA(MaSS) Early Career Mathematical Scientists' Mobility Grants

NGA(MaSS) invites applications from early career mathematical sciences who plan to either attend thematic and focus programmes organised by mathematical sciences research institutes or plan to undertake short-term research sabbaticals.

[MORE INFO](#)

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## IMSA: Call for Applications for Grant Funding

The IMSA, an initiative of CoE–MaSS and NGA(MaSS), invites applications for grant funding to support research collaborations among early career and next generation mathematical scientists at its member institutions. Up to 20 research collaborations can be supported.

**Types of grants available:**

**(1) Research-in-Teams** offers up to R15,000 per participant for short, focused research meetings, ideally held alongside major conferences. [APPLY](#)

**(2) Joint Research and Postgraduate Training Programmes** provide up to R200,000 over three years for collaborative research, training activities, and academic exchanges. [APPLY](#)

**(3) International Research Collaborations** – Existing collaboration networks are encouraged to explore international collaborations with research groups, or established researchers elsewhere, that share the same interests. To apply, submit a Letter of Intent to Emeritus Prof Loyiso G. Nongxa at [loyiso.nongxa@wits.ac.za](mailto:loyiso.nongxa@wits.ac.za) and [mathsci.imsa@wits.ac.za](mailto:mathsci.imsa@wits.ac.za)

# AI Research Foundations for Higher Education

Empowering Universities to  
Lead Africa's AI Future

Expert-led

Purpose-built

Hands-on Learning

Freely available

with support from  
**Google.org**

## AI Research Foundations for Higher Education

Through funding from Google.org, AIMS South Africa is supporting ten South African Higher Education Institutions (HEIs) to strengthen AI teaching at university level.

The initiative draws on Google DeepMind's AI Research Foundations curriculum and provides:

- Grants of up to \$57,300 per institution (up to \$11,460 per lecturer, for a maximum of five lecturers)
- Fully funded week-long training workshops for lecturers and teaching assistants
- Blended-learning toolkits developed by University College London
- An adaptable curriculum suitable for applied mathematics, data science, engineering, statistics and other senior STEM courses
- The programme also supports HEIs in Nigeria, Kenya and Ghana.

Institutions interested in introducing or refreshing AI courses can find nomination details in the full programme document.

[MORE INFO](#)



## Call for Book Chapters: Statistics/ML/AI in Action for Sustainable Development

**Submission deadline:** 20 April 2026

Contributions are invited for an edited volume titled Statistics/ML/AI in Action for Sustainable Development, exploring how statistical modelling, machine learning and artificial intelligence can advance the Sustainable Development Goals (SDGs). This interdisciplinary book welcomes research and applied case studies from fields including statistics, health sciences, engineering, economics, environmental sciences and beyond, provided the work is grounded in Statistics/ML/AI and clearly linked to one or more SDGs.

Submit a proposed chapter title and extended abstract by **20 April 2026**, with full chapters due **30 November 2026**. The volume will be published by Springer in 2027 as part of the ICSA Book Series in Statistics.

[MORE INFO](#)

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## Call for papers: Special Issue of Advances in Computational Physics and Mathematical Physics

**Submission deadline:** 20 July 2026

Contributions can be provided for a Special Issue of Advances in Computational Physics and Mathematical Physics. The issue, guest edited by Prof Michael Tsamparlis and Dr Aniekan Magnus Ukpong, focuses on partial differential equations (PDEs) as powerful tools for modeling physical systems.

Submissions are invited on topics such as fluid dynamics, scattering problems, wave interactions, cosmology, plasma physics, and AI-assisted methods, with a particular emphasis on approaches that integrate analytical insights into computational techniques. Both original research and review articles are welcome.

[Submission](#)

# Foreign nationals with visa issues

## Do you know of foreign nationals in the theoretical and computational sciences who are struggling to get a South African visa?

We will try to help expedite the visa process for foreign nationals who:

- have been appointed to fill critical positions in the theoretical and computational sciences in South Africa, or
- have accepted a postdoctoral position at a South African university in the abovementioned scarce skills fields.

Please encourage them to [share their details with us here](#).

NITheCS CONTACT DETAILS:

[info@nithecs.ac.za](mailto:info@nithecs.ac.za)

