



Australian
National
University



INFORMATION FOR CANDIDATES
FOR THE POSITION OF
POSTDOCTORAL/RESEARCH FELLOW
ARC CENTRE OF EXCELLENCE FOR
TRANSFORMATIVE META-OPTICAL
SYSTEMS (TMOS)
FEMALE IDENTIFIED POSITION

ANU College of
SCIENCE

Closing date: 30 October 2020

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MESSAGE FROM THE DIRECTOR

The Australian Research Council, Centre of Excellence for Transformative Meta-Optical Systems (TMOS) at the Australian National University is recently established and aims to develop the next generation of miniaturised optical systems with functionalities beyond what is conceived of today.

Examples include real-time holographic displays, vision for autofocus systems and wearable health sensors. However, we have many challenges to overcome. We need a team of brilliant minds to work together to solve outstanding problems in fundamental and applied science.

TMOS has seven years of funding to support our team across five Australian universities – The Australian National University (ANU), University of Technology Sydney (UTS), University of Melbourne (UoM), RMIT University (RMIT) and the University of Western Australia (UWA). We have more than twenty national and international partners that will joint efforts to advance fundamental science, create new applications and solve pressing industry problems. We are creating a collective enterprise with the world's best researchers and professionals. I welcome you to be part of it.

We are serious about excellence and to achieve it we need the best team working in an inclusive workplace. For our team, TMOS offers support for parents and carers to participate to their fullest. We support flexible work arrangements and active participation in university life with teaching, outreach, student supervision, grant writing, committee service, industry partnership and scientific papers all on the agenda. We mentor our team and support everyone to success.

The roles advertised in this brochure are at The Australian National University, located in Canberra. I have made Canberra my home for the last 18 years. Having lived in five different countries on three continents, I can say Canberra is a wonderful place to build your career and raise a family.

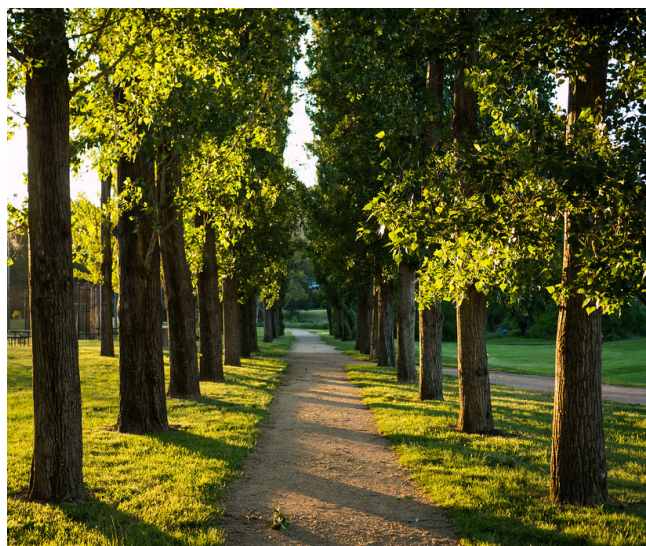


Professor Dragomir Neshev
Director, TMOS
The Australian National University

Canberra is Australia's best kept secret. You can expect a warm welcome from our team and the Research School of Physics at ANU. You will make lifelong friends with your co-workers and beyond and produce the best research of your career so far.

If you are an outstanding early career academic with a passion for research and have experience in at least one or more of the following areas outlined in the selection criteria, we would welcome an application from you.

You can learn more about us [here!](#)



MESSAGE FROM THE EQUITY AND DIVERSITY COMMITTEE

As a Centre, we strongly believe that diversity increases productivity and innovation. Diversity and fostering a culture of inclusiveness will be a key contributor to the scientific excellence of TMOS.

The TMOS Equity and Diversity Committee will initiate and implement numerous strategies around recruiting (this will include bias/diversity training and careful consideration of research opportunity), mentoring and career development and support of researchers through carer grants and other initiatives.

We will also address the pipeline issue by sparking an interest in children starting from primary school to discover the wonders of science and consider Science Technology Engineering Maths and Medicine (STEMM) as a future career option.

We will work with Science and Technology Australia (STA), Australian Academy of Science (AAS) and Technology and Engineering (ATSE) to support and promote their initiatives.

I have significant expertise in effecting change in this space as I co-founded the Women Researchers' network at RMIT University in 2013, am part of the RMIT University Athena SWAN Working Party, am on the Board of Directors for Women in STEMM Australia and have served on the Expert Working Group for the Women in STEMM Decadal Plan.



Professor Madhu Bhaskaran

Chair, Equity and Diversity Committee
TMOS, RMIT

I will bring my experience and knowledge as the Chair of the Equity and Diversity Committee to drive an inclusive culture for every member of TMOS.



THE UNIVERSITY

The Australian National University (ANU) is one of the world's foremost research universities.

Distinguished by its relentless pursuit of excellence, the University attracts leading academics and outstanding students from Australia and around the world.

Further information about ANU can be found at: <http://www.anu.edu.au/about>.

History

The University was established by the Commonwealth Parliament in 1946 specifically to lead the development of the intellectual capacity of the nation through research and research training in line with the best international standards. It is the only Australian university established by a Commonwealth Act of Parliament. In 1960, the University accepted responsibility for undergraduate education along with an expectation that the highest standards of education would be achieved.

Scale

The University has 4,300 staff, 10,286 undergraduates and 6,925 postgraduate students. Its annual revenue exceeds \$1.0 billion and consolidated assets are worth \$2.5 billion.

Partnerships

The University has strong links with leading research institutions in Australia and overseas. It is a founding member of the International Alliance of Research Universities, a co-operative network of 10 eminent international research-intensive universities which includes:

- > University of Cambridge
- > University of Oxford
- > University of California, Berkeley
- > Yale University
- > Peking University
- > National University of Singapore
- > University of Tokyo
- > University of Copenhagen

Research -intensive education

As the specially-chartered national university, the University conducts research at the highest levels in all of its colleges, and offers a unique research led education to undergraduate and postgraduate students as well as postdoctoral fellows.

The University advances the national intellectual and creative capacity in three key ways:

1. Through broad-based research and research intensive education in the disciplines fundamental to all knowledge: the humanities, the sciences and the social sciences,
2. By supporting research and research-intensive education in a spectrum of professional disciplines, and
3. By studying Australia in its various contexts.

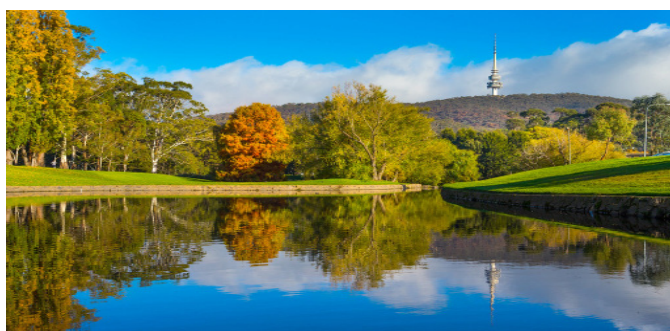
It is the aim of the University to achieve its objectives by creating an inspirational working environment for all its staff, students and visitors.

In each of its endeavours, the University strives to achieve at the levels of the world's great universities.

Location

The University campus has over 200 buildings and occupies 145 hectares adjacent to the city centre of Canberra. The University also has a number of smaller campuses:

- > Mount Stromlo Observatory (west of Canberra)
- > Siding Spring Observatory (near Coonabarabran, western New South Wales)
- > North Australia Research Unit (Darwin, Northern Territory)
- > Kioloa (coastal campus near Bawley Point, on the New South Wales South Coast)
- > ANU Medical School – The Canberra Hospital campus
- > ANU Medical School – Calvary Hospital
- > Health Facilities in South East New South Wales



THE CENTRE OF EXCELLENCE FOR TRANSFORMATIVE META-OPTICAL SYSTEMS

Australian Research Council Centre of Excellence for Transformative Meta-Optical Systems (TMOS) brings together five Australian and 14 leading international universities as well as Australian and global companies to create entirely new optics-based technologies with enormous market potential.

The Centre has received \$34.9 million funding from the Australian Research Council to operate from 2020-2027.

We will develop the next-generation of miniaturised optical systems with functionalities beyond what is conceivable today. By harnessing the disruptive concept of meta-optics, the Centre will overcome complex challenges in light generation, manipulation and detection at the nanoscale.

The Centre brings together a trans-disciplinary team of world-leaders in science, technology and engineering to deliver scientific innovations in optical systems for the Fourth Industrial Revolution.

TMOS has three Research Themes, which will be collaboratively pursued across our network of universities and partners.

Theme One is Generate, which will explore nanoscale lasing, frequency conversion by nonlinear meta-optics, and a quantum on-demand single photon sources.

Theme Two is Manipulate, which will explore holographic and image processing meta-optics, as well as dynamic reconfigurability of meta-optical elements.

Theme Three is Detect, which will explore meta-optical devices for seeing the invisible, including multi-modal detection and enhanced infrared imaging.

Our scientific outcomes will translate to new technologies such as real-time holographic displays, wearable sensors, artificial vision for autonomous systems, and ultra-fast light-based WiFi (LiFi).

TMOS is aiming to grow workforce capacity in meta-optics supporting more science graduates and postgraduates, reaching out to primary and high school students to grow interest in STEMM, share our discoveries with the public and industry, and build a diverse workforce for Australia and the world.



ABOUT THE ROLE

Purpose Statement

The ARC Centre of Excellence for Transformative Meta-Optical Systems (TMOS), led by the Australian National University (ANU), brings together four other Australian universities (University of Technology Sydney, RMIT University, University of Melbourne and the University of Western Australia) and 13 leading international universities as well as Australian and global companies to create entirely new optics-based technologies with enormous market potential. The Centre has received \$34.9 million funding from the Australian Research Council to operate from 2020-2027.

TMOS will develop the next-generation of miniaturised optical systems with functionalities beyond what is conceivable today. By harnessing the disruptive concept of meta-optics, the Centre will overcome complex challenges in light generation, manipulation and detection at the nanoscale. The Centre brings together a trans-disciplinary team of world-leaders in science, technology and engineering to deliver scientific innovations in optical systems for the Fourth Industrial Revolution.

As a Centre, we strongly believe that diversity improves ideas and innovation and leads to better outcomes and productivity. Diversity and fostering a culture of inclusiveness will be a key contributor to the scientific excellence of TMOS. TMOS aims to develop a multidisciplinary, dynamic, interactive and collaborative culture fostering future research leaders who thrive in academic excellence and are equipped with strong transferable skills.

ANU is a member of the Science in Australia Gender Equity (SAGE) Athena SWAN Program to support gender equity and diversity in the Science, Technology, Engineering, Mathematics and Medicine (STEMM) disciplines, and is a Bronze Medal recipient.

The Postdoctoral/Research Fellow is expected to undertake work in all three areas of academic activity – research, education and service (including outreach). The research activity must contribute directly to the research programs/themes of TMOS. The allocation of time to each area will be discussed with the position supervisor annually and be reflective of the conditions of the external funding, the appointees research agenda, school and interdisciplinary teaching requirements and leadership opportunities within the School environment. The Postdoctoral/Research Fellow may also be required to supervise or mentor junior staff, and undertake leadership roles as applicable. The staff member will contribute cooperatively to the overall intellectual life of the School, College and University.

Position Dimension & Relationships

The Postdoctoral/Research Fellow will be a member of Research School of Physics, accountable to the Director of TMOS and Director of the School.

The Postdoctoral/Research Fellow will be expected to work collegially, leading by example to develop and maintain effective, productive and beneficial workplace relationships within the all academic and professional School and College staff, students and honorary appointees, as well as with industry and TMOS stakeholders.

This position will also have a mentoring role for students and junior staff and will engage in collegial and productive collaborations with local, national and where possible, international colleagues.



ROLE STATEMENT & SELECTION CRITERIA

Role Statement Level A

In their role as an Academic Level A the Postdoctoral Fellow is expected to:

1. Undertake independent research in one of the following areas with a view to publishing original and innovative results in refereed journals, present research at academic seminars and at national and international conferences, and collaborate with other researchers at a national level. This includes working as part of a team on an externally funded project subject to deadlines and being primarily responsible for project delivery in some areas of experimental and theoretical research.

- epitaxial growth and characterisation of novel compound semiconductor nanostructures
- nanoscale lasers, light emitters and photodetectors
- nonlinear light matter interactions with dielectric and metallic nanostructures
- tunable nanostructures and metasurfaces
- quantum nanophotonics
- metasurface holography and image processing
- semiconductor metamaterial
- optical spectroscopy of semiconductors

2. Collaborate with senior staff to actively seek and secure external funding, assist to prepare and submit research proposals to external funding bodies as appropriate.

3. Subject to the requirements of the funding source and where an opportunity exists, the occupant may be required to contribute to the teaching activities of the School at the undergraduate and graduate levels. This includes, but is not limited to, the preparation and delivery of lectures and tutorials, the preparation of online material, marking and assessment, consultations, and with students or acting as subject coordinators.

4. Supervise students working on individual or group projects at undergraduate, honours, graduate-coursework and post-graduate levels.

5. Assist with the supervision of research support staff in your research area.

6. Actively contribute to all aspects of the operation of the School.

7. Assist in outreach activities including to prospective students, research institutes, industry, government, the media and the general public.

8. Maintain high academic standards in all education, research and administration endeavours.

9. Take responsibility for their own workplace health and safety and not wilfully place at risk the health and safety of another person in the workplace.

10. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.

11. Other duties as required that are consistent with the classification of the position.

Selection Criteria Level A

1. A PhD (or awarding of a PhD within six months of appointment commencement) in Physics, Electrical/Electronics Engineering, Materials Science, or equivalent qualifications and experience in a related area, with a track record of independent research in the above fields as evidenced by publications in peer-reviewed journals and conferences.

2. Evidence of the ability to articulate and prosecute innovative experimental or theoretical research in the following fields:

- epitaxial growth and characterisation of compound semiconductors
- design, fabrication and characterisation of optoelectronic devices
- nonlinear light matter interactions with dielectric and metallic nanostructures
- tunable nanostructures and metasurfaces
- quantum nanophotonics
- metasurface holography and image processing
- semiconductor metamaterials
- optical spectroscopy of semiconductors

3. An ability and commitment to contribute to bids for competitive external funding to support individual and collaborative research activities.

4. Evidence of an ability and willingness to teach at all levels.

5. The ability to assist in the supervision of students working on research projects.

6. The ability to work as part of a team and to meet deadlines.

7. Excellent oral and written English language skills and a demonstrated ability to communicate and interact effectively with a variety of staff and students in a cross-disciplinary academic environment and to foster respectful and productive working relationships with staff, students and colleagues at all levels.

8. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.

ROLE STATEMENT & SELECTION CRITERIA

Role Statement Level B

In their role as an Academic Level B the Research Fellow is expected to:

1. Undertake independent research in one of the following areas with a view to publishing original and innovative results in refereed journals, present research at academic seminars and at national and international conferences, and collaborate with other researchers at a national and/or international level. This includes working as part of a team on an externally funded project subject to deadlines and being primarily responsible for project delivery in some areas of experimental and theoretical research.

- epitaxial growth and characterisation of novel compound semiconductor nanostructures
- nanoscale lasers, light emitters and photodetectors
- nonlinear light matter interactions with dielectric and metallic nanostructures
- tunable nanostructures and metasurfaces
- quantum nanophotonics
- metasurface holography and image processing
- semiconductor metamaterials
- optical spectroscopy of semiconductors

2. Actively seek and secure external funding including the preparation and submission of research proposals to external funding bodies.

3. Subject to the requirements of the funding source and where an opportunity exists, the occupant may be required to contribute to the teaching activities of the School at the undergraduate and graduate levels. This includes, but is not limited to, the preparation and delivery of lectures and tutorials, the preparation of online material, marking and assessment, consultations with students, acting as subject coordinators and the initiation and development of course/subject material.

4. Supervise students working on individual or group projects at undergraduate, honours, graduate-coursework and post-graduate levels.

5. Supervise and mentor Postdoctoral Fellow's and research support staff in your research area.

6. Actively contribute to all aspects of the operation of the School. This may include representation through committee memberships.

7. Assist in outreach activities including to prospective students, research institutes, industry, government, the media and the general public.

8. Maintain high academic standards in all education, research and administration endeavours.

9. Take responsibility for their own workplace health and safety and not wilfully place at risk the health and safety of another person in the workplace.

10. A demonstrated understanding of equal opportunity principles and policies and a commitment to their application in a university context.

11. Other duties as required that are consistent with the classification of the position.

Selection Criteria Level B

1. A PhD in Physics, Electrical/Electronics Engineering, Materials Science or a related area, with a track record of independent research in the above fields as evidenced by publications in peer-reviewed journals and conferences, a record of developing and maintaining collaborations and by other measures such as awards, and invitations to present at conferences.

2. Evidence of the ability to articulate and prosecute innovative research in the following fields:

- epitaxial growth and characterisation of compound semiconductors
- design, fabrication and characterisation of optoelectronic devices
- nonlinear light matter interactions with dielectric and metallic nanostructures
- tunable nanostructures and metasurfaces
- quantum nanophotonics
- metasurface holography and image processing
- semiconductor metamaterials
- optical spectroscopy of semiconductors

3. A demonstrated ability and commitment to apply for competitive external funding to support individual and collaborative research activities.

4. Evidence of an ability and willingness to teach at all levels.

5. An ability to supervise and graduate high quality PhD/ Masters research students.

6. The demonstrated ability to work as part of a team, contributing to team management and meeting deadlines for project elements.

7. Excellent oral and written English language skills and a demonstrated ability to communicate and interact effectively with a variety of staff and students in a cross-disciplinary academic environment and to foster respectful and productive working relationships with staff, students and colleagues at all levels.

8. A demonstrated understanding academic environment and to foster respectful and productive working relationships with staff, students and colleagues at all levels.

WHY CHOOSE CANBERRA?

About Canberra

Canberra has the power to surprise, with its abundance of food, wine, art, culture, ideas and innovation. As an evolving city, this element of surprise continues even once you've made Canberra your home, with new developments, events and opportunities constantly emerging to keep life interesting.

Canberra is also a planned city – designed to maximise opportunities for work and play. As our Nation's Capital, big ideas emerge, circulate and grow here, thanks to unique links between leading thinkers in business, government, education and research. Our dynamic economy, highly educated workforce and an innovative business culture provide career and business opportunities unique to Canberra.

Our healthy appetite for outdoor pursuits is enhanced by the natural resources available: from sailing on Lake Burley Griffin, mountain biking at the world class Mount Stromlo facility or heading up to the Snowy Mountains for a day on the slopes.

We are also home to most of Australia's major national cultural institutions, with whom the University has a close relationship, and a cultural calendar overflowing with international exhibitions, arts festivals and entertainment.

Where to Live

Canberra is designed to maximise the quality of life, built on a blueprint that connects people with community and nature, Canberra provides you the opportunity to create a unique work/life balance, wherever you choose to live.

The architects who designed Canberra, Walter and Marion Burley Griffin, had a master plan to create a series of 'satellite cities' separated by nature reserves and connected with major roads.

Today their vision lives on, with Canberra divided into seven distinct regions of residential suburbs, each serviced by a central business district.

The resulting benefits are that commuting times are short, employment hubs are virtually on your doorstep and recreational facilities are within walking distance, regardless of where you live.

Find information on the Canberra lifestyle please visit [Canberra Your Future at: http://www.canberrayourfuture.com.au/](http://www.canberrayourfuture.com.au/).



HOW TO APPLY

Applicants should provide a confidential email address and suitable daytime and evening telephone contact details (including mobile) as well as details of availability during this period.

How to apply

Please submit your application online via the University's online recruitment portal. This is a female identified role and only applications from female candidates will be accepted.

For applications to be accepted they must contain:

- > a full curriculum vitae
- > a response to the selection criteria
- > referee details
- > availability

Curriculum Vitae

- > details of education, professional training and qualifications
- > full list of publications
- > positions held, including relevant dates, titles
- > reporting lines, responsibilities and key achievements
- > details of teaching and research experience (as appropriate)
- > any other relevant information such as contributions to professional associations and learned societies, and community activities

Identified Position

This advertisement has been prepared in accordance with the University's Identified Positions Procedure. The University supports special measures to improve access, participation and inclusion of academic women who are under-represented in the field of physics. For more information about staff equity at ANU, visit <https://services.anu.edu.au/human-resources/respect-inclusion>. Only applications from Female candidates will be considered.

Please note: The successful applicant must have rights to live and work in Australia

Response to selection criteria

Applicants are required to respond to each of the criteria, taking into account experience, past roles and expertise.

Referees

- > Applicants must provide full contact details for three referees who have agreed to supply confidential references if requested by the University.
- > Applicants should state their relationship to the referees and why they have been nominated to speak on the candidate's behalf.
- > Referees will only be contacted after consultation with the candidate.
- > It is the applicant's responsibility to ensure referees are willing to provide reports when contacted.
- > The University reserves the right to seek reports on the suitability of candidates from experts in the field, other than those nominated by the candidate.
- > Should a candidate not wish a specific person or persons to be contacted, please advise at the time of application.

Availability

- > Applicants are asked to provide an indication of the earliest date on which they would be available to commence duties at the University.
- > The University reserves the right to invite applications and/or to not make an appointment.

Contact

For a confidential discussion, please contact:



Professor Andrey Sukhorukov
Andrey.Sukhorukov@anu.edu.au



Professor Lan Fu
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