Division of Condensed Matter Physics
Association of Asia Pacific Physical Societies

DCMP NEWSLETTER

Vol.05 Issue.01

Division of Condensed Matter Physics Association of Asia-Pacific Physical Societies

Editor | Prof. Tse-Ming Chen
Editor | Prof. Shriganesh Prabhu
Editor | Prof. Golrokh Akhgar

CONTENTS

MESSAGE FROM THE CHAIR

Hai-Hu Wen
DCMP Chair Professor,
Nanjing University, China

The DCMP (Division of Condensed Matter Physics) of the AAPPS (Association of the Asian Pacific Physical Society) has come to the third term since the beginning of this year (2025). Thanks to the great contributions by all EXCO members of the DCMP-AAPPS in last two terms, especially by the two chairs Prof. Je-Geun Park (Term Jan. 2021—Dec. 2022) and Prof. Hiroyuki Nojiri (Term Jan 2023—Dec. 2024), now our division has become an important platform for the academic exchange and activities concerning condensed matter physics across the Asian Pacific region. Up to date, our division has a membership by six national or regional physical societies, more than 300 individual memberships. Thanks also for the trust and support from our EXCO members, I am elected to serve as the chair of the next term (2025-2026). I am very happy to work together with two vice-Chairs, Prof. Kirrily Rule (ANSTO, Sydney), and Prof. Tse-Ming Chen (National Cheng Kung University, Taiwan) and all EXCO members. I feel it is a great honor for me to take this position, and meanwhile it should serve with more and heavier duty than before.

In the new term, we plan to absorb new physical societies to join our DCMP-AAPPS as new members. Moreover, we hope to expand the individual membership by more than 100 in coming two years. The Newsletter will be an important representative of our DCMP, all correspondences associated with the condensed matter physics in this region are welcome and please addressed to Prof. Tse-Ming Chen. In October 2025, we will have the APPC16 in Hainan island, China. Our annual conference AC2MP2025 will be hold combined with the sessions of condensed matter physics of this conference. We will actively respond to all academic tasks assigned by the AAPPS to us, such as selecting the CN Yang prize for condensed matter physics in Asian Pacific region, attract more people to attend the APPC16 and AC2MP meetings, etc. I hope you frequently visit our website http://aapps-dcmp.org/ and find the useful information. I am sure the DCMP-AAPPS will be a very good and fruitful platform for you in your scientific career.

Hai–Hu Wen
Chair of the 3rd term DCMP-AAPPS

Introduction to the EXCO members

HAI-HU WEN

DCMP Chair

Professor,

Nanjing University, China

Senior professor of physics in Nanjing University, China; Yangtze River Scholarship Professor; Winner of the Outstanding Youth Foundation of China; American Physical Society Fellow, Director of Center for Superconducting Physics and Materials of Nanjing university.

Working experiences: Leading a center for fundamental research on superconductivity in Nanjing University. Supervising the group for exploration of new superconducting materials, investigation of non-Fermi liquid behavior, unconventional pairing mechanism of cuprates and iron pnictide superconductors, mixed state properties, etc. His group has made several important contributions in exploring new superconductors, and the unconventional pairing mechanism. For example, he and colleagues discovered the new iorn based superconductor Sr4V2O6Fe2As2, syntehsized the first iron based single crystal NdFeAsO1-xFx and determined the intrinsic anisotropy, carried out systematic studies for showing the gap sign change in serval types of iron based superconductors, etc.

Published more than 510 scientific papers in internationally recognized journals, received over 14000 citations, h-index 67. Delivered more than 100 speeches or invited talks (including 10+ times plenary talks) at international conferences. The editor member or associate editor of several international recognized journals, including npj-Quantum Materials, Chinese Physics Letters, Science China-PMA, Philosophical Magazine (UK), etc.

TSE-MING CHEN

DCMP Vice Chair

Professor,

National Cheng Kung University, Taiwan

Tse-Ming Chen is a Professor in Physics and also serves as the Deputy Director of Center for Quantum Frontiers of Research & Technology (QFort) at National Cheng Kung University in Taiwan, where he joined the faculty in 2010. Now he is also the Convener of the International Affair Committee in the Physical Society of Taiwan (TPS).

Tse-Ming received his BS and MS degrees from National Taiwan University in Taiwan and PhD from Cambridge University in UK, all in physics. His research interests cover a wide range of meso-scopic physics, spintronics, quantum electronics, and quantum computing. His expertise includes design, nanofabrication, and precision low temperature (down to 10 mK) electrical measurements of quantum devices based on such diverse materials as semiconductor, superconductor, graphene, van der Waal layered materials, and complex oxides. Tse-Ming is a Recipient of NSTC (previously known as MOST) Outstanding Research Award (2023 & 2019), MOST Ta-You Wu Memorial Award (2016), Academia Sinica Research Award for Junior Research Investigators (2016), Innovation Award for Junior Research Investigators from the Foundation for the Advancement of Outstanding Scholarship (2016), etc.

KIRRILY RULE

DCMP Vice Chair

Professor,
Australia's Nuclear Science and Technology Organisation (ANSTO), Australia

Prof. Kirrily Rule is a Senior Principal Instrument Scientist at ANSTO, Australia, co-responsible for operating the two triple axis spectrometers, Taipan and Sika at the Australian Centre for Neutron Scattering. Kirrily completed her PhD at Monash University in 2004 and joined McMaster University in Canada for a two-year postdoc position before taking up a neutron instrument scientist position at Helmholtz Zentrum Berlin. Kirrily is also an honorary Professor at the University of Wollongong where she is currently supervising 4 PhD students. Kirrily has previously held the role of Honorary National Secretary of the Australian Institute of Physics (AIP) from 2017-2023 and currently holds the role of Chair of the Condensed Matter and Materials Topical group of the AIP.

Kirrily's main scientific focus is to measure dynamics in materials using inelastic neutron scattering techniques. Her main research interests are focused on novel and low dimensional magnetic materials – understanding how the magnetic ions interact with each other and developing models to understand their behaviour. Kirrily is the recipient of numerous Australian Research Council (ARC) grants which has led to high impact publications in the field of low dimensional quantum magnetism and more recently, in the field of functional materials which includes thermoelectric materials, solar-cells, and magnetic topological insulators.

KWANG-YONG CHOI

Professor,
Sungkyunkwan University (SKKU), South Korea

Dr. Kwang-Yong Choi is a Professor of Physics at Sungkyunkwan University (SKKU). In 2004, he earned his Ph.D. in Physics from Aachen Technical University, Germany. Before coming to SKKU, he did postdoctoral research at IMR, Tohoku University, and National High Magnetic Field Lab, USA, and worked as a Professor at Chung-Ang University. Prof. Choi was a recipient of the Humboldt Fellowship in 2008 and serves as editorial boards of Crystals.

Prof. Choi's current research interests include Majorana fermions, quantum magnets, topological materials, and strongly correlated systems. By combining material design and state-of-art spectroscopies, he seeks to expand our understanding of quantum systems towards future technology as well as to braid Majorana anyons in Kitaev quantum magnets.

GOLROKH AKHGAR

Professor,
Commonwealth Scientific and Industrial Research Organisation(CSIRO), Australia

Dr. Golrokh (Gol) Akhgar is a Research Scientist at the Commonwealth Scientific and Industrial Research Organisation (CSIRO), specializing in condensed matter physics and quantum transport. Her expertise includes thin film growth, device fabrication, and quantum sensors, with a strong focus on topological materials, magnetic topological insulators, and high-temperature superconductors. Her research spans quantum transport in 2D materials to the development of novel quantum devices, with applications in next-generation electronics and sensing technologies.

Golrokh completed her PhD at La Trobe University in 2019 before taking on postdoctoral research roles at Monash University, where she was also appointed as a Lecturer in the Department of Materials Science and Engineering. She is dedicated to advancing experimental condensed matter physics through cutting-edge research and collaborations with industry and government. Her work contributes to the development of innovative quantum technologies, bridging the gap between fundamental science and real-world applications

---

HIROYUKI NOJIRI

DCMP Secretary
Professor,
Tohoku University, Japan

Prof. Hiroyuki Nojiri is a distinguished physicist specializing in magnetism and high magnetic field science. He received his Bachelor's degree in Physics from Kyoto University in 1984 and was awarded a Ph.D. in Physics from Osaka University in 1993. His academic career began in 1991 as a Research Associate at the Institute for Solid State Physics, University of Tokyo. In 1995, he was appointed Associate Professor at the Institute for Materials Research, Tohoku University. He became a full Professor at Okayama University in 2001 and returned to Tohoku University as a Professor in 2004.

Prof. Nojiri's research focuses on quantum magnetism in low-dimensional spin systems, strongly correlated electron systems, and molecular magnets. He is a leading expert in high magnetic field experiments, particularly in terahertz-frequency electron spin resonance (THz-ESR), and X-ray and neutron scattering techniques. He is internationally recognized for his innovative “flying magnet” system, which enables advanced experiments under extreme magnetic fields in collaboration with researchers worldwide.

In addition to his research activities, Prof. Nojiri serves as the Director of the International Collaboration Center and Coordinator of the Global Institute for Materials Tohoku Program, where he leads efforts to promote international cooperation in condensed matter physics and materials science.

KEE HOON KIM

Professor,
Seoul National University, South Korea

Prof. Kee Hoon Kim is a Professor of Physics & Astronomy at Seoul National University since 2003. In 1998, he earned his Ph.D. in Physics from Seoul National University. Before joining to SNU, he did postdoctoral research at Rutgers University, and National High Magnetic Field Lab, USA. He is an elected fellow of American Physical Society (2017).

Prof. Kim has worked on the condensed matter experiment, questioning how a quantum phase transition of a correlated electronic system with strong spin-orbit-lattice coupling can influence the phase diagram and emergent phases created in the vicinity of the quantum critical point. He has used high magnetic fields as a quantum variable to uncover multiple phases in heavy fermion compounds, URu2Si2 and related U(Ru,Rh)2Si2, providing deeper insight on the origin of the hidden order in the compound. His research then has focused on material discoveries and understanding the underlying physics thereof, in the field of multiferroics (record high magneto-electric coupling), transparent high mobility oxides (La,Ba)SnO3 system for device applications, and iron based superconductors (e.g. (Na,Li)FeAs system). He has recently developed high pressure techniques to study pressure-induced quantum phase transitions of topology, charge density wave, magnetic and nematic orders, and their relationship with the conventional/unconventional superconductivity in 2 D chalcogenides and kagome materials.

YUKO HOSOKOSHI

Professor,
Osaka Metropolitan University, Japan

1996 PhD. Science, Tokyo University
1996-2002 Assistant Professor, Institute for Molecular Science
2002-2009 Associate Professor, Osaka Prefecture University
2009-Present, Professor, Osaka Metropolitan University(Reorganized from Osaka Prefecture University)

Field
Synthesis of new molecular crystal, organic molecular magnetism, magnetism

LI LU

Professor,
Chinese Academy of Sciences (CAS), China

Dr. Li Lu is a researcher in the Institute of Physics, Chinese Academy of Sciences (IOP, CAS). He obtained a B.S. degree from Nanjing University in 1982 and a Ph.D. from IOP in 1992. He was a visiting scientist at UC Berkeley during 1992-1995, and became a full professor of IOP in 1996. Dr. Li Lu is an experimentalist specialized in electron transport in low-dimensional materials and mesoscopic devices. He developed a 3-omega method for measuring the specific heat and thermal conductivity of nanowires, and jointly discovered the quantum anomalous Hall effect in a Chern insulator. His current research interest is on topological quantum states and devices at ultralow temperatures.

Dr. Li Lu was the founding director of the Laboratory for Physics under Extreme Conditions, IOP during 2000-2005, the director of the Laboratory of Solid-state Quantum Information & Computation, IOP during 2009-2017, the deputy director general of IOP during 2006-2012, and the founding director of the IOP Huairou campus with Synergetic Extreme Conditions User Facility since 2020.

CHIH-WEI LUO

Professor,
National Yang Ming Chiao Tung University, Taiwan

Chih-Wei Luo is a professor and the Chairman of the Department of Electrophysics, National Yang Ming Chiao Tung University (NYCU), TAIWAN. After receiving his Ph.D. at National Chiao Tung University (NCTU), he joined NCTU in 2006 and started independent research. He was an Associate Vice President in the Office of International Affairs at NCTU (2016-2018). Now he is also the Convener of the Division of Condensed Matter Physics of the Physical Society of Taiwan (TPS).

His research interests include ultrafast dynamics in strongly correlated materials (e.g., topological insulators, superconductors, etc.) and photovoltaic materials, THz spectroscopy, and material processing by femtosecond lasers. His honors and awards include the Outstanding Physics Research Award of The Physical Society of Taiwan (2025); the Distinguished Young Investigator Grant of the Ministry of Science and Technology (2014 & 2017); the Meritorious Teaching Award from National Chiao Tung University (2016); the Young Scholar Outstanding Research Award in College of Science of National Chiao Tung University (2012); Phi Tau Phi Scholastic Honor Society, Taiwan (2004).

SHRIGANESH PRABHU

Professor,
Tata Institute of Fundamental Research, Mumbai, India

Shriganesh S. Prabhu is Professor of Physics at Tata Institute of Fundamental Research (TIFR) with extensive expertise in Terahertz (THz) spectroscopy and metamaterials. He earned his Ph.D. degree fromTIFR after obtaining his bachelor's and master's degrees in Physics from the University of Mumbai and Pune University, respectively. After completing his Ph.D., Dr. Prabhu worked as a Postdoctoral Researcher in Emory University, USA. Dr. Prabhu's research interests include ultrafast carrier dynamics, developing THz technology, THz optical components, THz-waveguide-based sensors, and THz source-detector devices using plasmonic antenna designs. He has authored more than 81+ papers and numerous articles on THz technology in international journals and magazines.

His current research covers topics such as terahertz metamaterials, optical metamaterials, compound semiconductors, molecular biophysics, anharmonic lattice modes, biochemistry, biomedical materials, dichroism, and dielectric materials, Near Field THz Microscopy and Pump-Probe Spectroscopy using THz and/or Different Wavelength Excitation laser pulses.

Google Scholar Profile:
https://scholar.google.co.in/citations?user=HdWH8pgAAAAJ&hl=en

THz Group Website:
https://sites.google.com/view/thzfoton/home?pli=1

Laboratory Website:
https://www.tifr.res.in/~Fotontional journals and magazines.

S. M. YUSUF

Professor,
Bhabha Atomic Research Centre, Mumbai, India

Dr. S M Yusuf currently serves as Director, Physics Group of Bhabha Atomic Research Centre, Mumbai, India, and senior Professor of Homi Bhabha National Institute, India. He also served as Director, Institute of Physics, Bhubaneswar, India. He is an elected fellow of Indian National Science Academy, the Indian Academy of Sciences, and National Academy of Sciences, India. He was a post-doctoral fellow at Argonne National Laboratory, USA, and a visiting scientist at the Institute of Materials Science,Spain.

He has expertize in magnetism and neutron scattering and worked significantly in the area of 1-D and 2-D magnetism driven by quantum fluctuations, phenomenon of magnetization reversal, magnetic proximity effect, high magnetocaloric effect, colossal magnetoresistance effect, coexistence of magnetic phases, etc. Presently, he serves as (i) VicePresident and Board member of Asia-Oceania Neutron Scattering Association, (ii) President of Indian Physics Association, (iii) Vice-President, Materials Research Society of India, and (iv) INSA nominated member of the National Committee for IUCr. He also served as (i) Vice Chair, Division of Condensed Matter Physics, Association of Asia Pacific Physical Society, (ii) President, Neutron Scattering Society of India, (iii) Vice-President of Indian Physics Association, (iv) Vice President, Indian Crystallographic Association, (v) Member of Neutron Science Review Committee, Oak Ridge National Laboratory, USA for eight years during 2013 – 2021. He was the recipient of U.S. Depart. of Energy Fellowship, and Spanish Ministry of Science & Education Fellowship.

Large facilities/institute/organization Reports

Taiwan Consortium of Emergent Crystalline Materials

Chia-Nung Kuo

Origin

The Taiwan Consortium of Emergent Crystalline Materials (TCECM) was established in 2012, with financial support from the National Science and Technology Council. It is the first national-level research team in Taiwan aimed at integrating novel-material development, single crystal growth, and thin film fabrication. TCECM brings together the most outstanding research teams in Taiwan specializing in materials science and development. Its mission is to become a sustainable national team equipped with experts and core facilities, in order to reinforce medium- to long-term techniques for novel-material fabrication and R&D, facilitate the advancement of materials-related technologies, and promote economic growth. With funding from the TCECM, the Crystal Growth Laboratory at the Department of Physics, National Cheng Kung University (NCKU), led by distinguished Professor Chin Shan Lue, has made remarkable accomplishment(s)after more than a decade of effort. Furthermore, with support from both the NSTC and the Ministry of Education, The NCKU Center of Crystal Research, led by Professor Mitch Ming-Chi Chou, will collaborate with industrial partners to accelerate commercialization and drive the advancement of Taiwan's key industries.

Crystal Growth Laboratory at the Department of Physics, NCKU

Professor Lue stated that to promote the domestic research level of crystalline materials and strengthen the international competitiveness of new material development, the NSTC initiated the "Emergent Crystalline Materials Project" in 2012, bringing together local experts to establish a crystalline material research platform TCECM, of which NCKU's crystal growth laboratory is a vital part. Over the years, not only have they achieved fruitful results in academic research, but they have also extended to applications. With the concept of "Materials@Taiwan", they have developed a greater number of novel single crystals in Taiwan, providing emergent materials for both academia and industry.

Professor Lue emphasized that the crystal growth technology is crucial for the development of advanced materials. Only with low-defect, high-purity crystals, the intrinsic physical properties of materials can be obtained, enabling the validation of experimental results and theoretical predictions. Major countries with strong industrial and academic capabilities, such as the United States, Germany, Japan, and China, have large permanent institutions dedicated to the crystal growth. In the past, researchers in Taiwan had to rely on these institutions for crystals or purchase them from abroad, which restricted their research progress and caused them to miss opportunities. This is precisely why the establishment of the TCECM was both necessary and urgent. Through growing high-quality single crystals and collaborating with over 80 research groups from both domestically and abroad, the laboratory achieved marvelous success.

He mentioned that through the efforts of Dr. Chia-Nung Kuo, a crystal growth expert, the crystal growth laboratory at NCKU has successfully grown more than 100 different types of high-quality single crystals. This remarkable achievement is very rare even among the global renowned crystal growth laboratories, as most laboratories concentrate on synthesizing only two or three kinds of crystals. As a result, NCKU has been able to collaborate with numerous domestic and international research teams and produce fruitful results, with over 20 foreign research institutions currently involved in these collaborations.

The NCKU Crystal Growth Laboratory has successfully grown over 100 types of high-quality single crystals. The high-quality single crystals are provided to over 20 international research institutions for various research topics

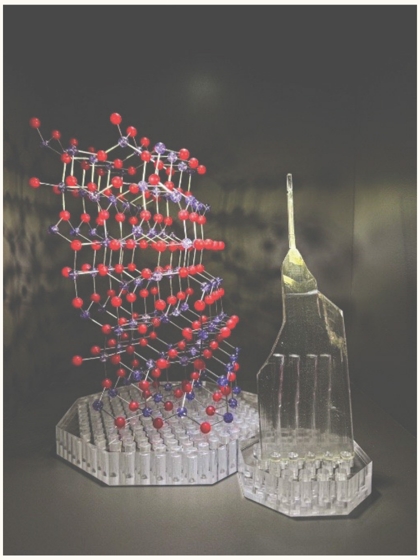
Dr. Chia-Nung Kuo explained that while natural mineral crystals take thousands or even millions of years to form, growing crystals in the laboratory requires adjusting various parameters and designing different crystal growth methods. Each process may take several days or even months, and often dozens of attempts are needed to successfully grow a single crystal. Such a work requires tremendous patience and perseverance. However, when the grown crystals contribute to yielding great research results from collaborators, all the effort is worthwhile. Dr. Kuo also expressed his curiosity, often trying to grow crystals never attempted before. For example, the crystal growth laboratory at NCKU was the first in the world to successfully grow single crystals of gold-tin compound (AuSn4), a material with exotic superconducting properties, and topological semimetals such as Pt3Te4 and NiTeSe, which are promising for catalytic applications.

Due to his long-standing dedication to crystalline material research and promotion, Professor Lue was awarded the "CTCI Outstanding Physics Research Award" at the Taiwan Physical Society Annual Meeting last year, recognizing his extraordinary contributions to connecting domestic and international collaborations of material-related research. Through these efforts, Professor Lue has published over 80 papers in international journals over the past five years, including four in top-tier Nature series journals within the last year, demonstrating outstanding academic achievement.

The NCKU Center of Crystal Research

Located at the NCKU-Delta Building in the Southern Taiwan Science Park (STSP), the NCKU Center of Crystal Research is currently the only academic institution in Taiwan equipped with ultra-high temperature (above 2300°C) large-size silicon carbide (SiC) crystal growth furnaces. The Center has long received support from the NSTC and the Ministry of Education's Higher Education SPROUT Project. The center has successfully overcome technical barriers in high-temperature SiC crystal growth, achieving the production of large-size, high-purity SiC crystals, which serve as key materials for Taiwan's next generation semiconductor industries. This breakthrough is expected to significantly enhance the performance of applications such as electric vehicles, 5G communications, and high-efficiency power management, helping Taiwan's industry gain a competitive edge in the global market. At the same time, the center has also successfully grown gallium oxide. With its ultra-wide bandgap properties, gallium oxide is regarded as a crucial material for next-generation high-power electronic components. Through a specially designed molten growth technique, the center's research team has developed high-quality gallium oxide crystals. Moving forward, the center will collaborate with domestic and international industry partners to accelerate commercialization and technology transfer, promoting the application of SiC and gallium oxide (Ga_2O_3) in semiconductors, optics, lasers, and medical technologies, thereby enhancing Taiwan's global competitiveness.

Located at the NCKU-Delta Building in the Southern Taiwan Science Park (STSP), the NCKU Center of Crystal Research is currently the only academic institution in Taiwan equipped with ultra-high temperature (above 2300°C) large-size silicon carbide (SiC) crystal growth furnaces. The Center has long received support from the NSTC and the Ministry of Education's Higher Education SPROUT Project. The center has successfully overcome technical barriers in high-temperature SiC crystal growth, achieving the production of large-size, high-purity SiC crystals, which serve as key materials for Taiwan's next generation semiconductor industries. This breakthrough is expected to significantly enhance the performance of applications such as electric vehicles, 5G communications, and high-efficiency power management, helping Taiwan's industry gain a competitive edge in the global market. At the same time, the center has also successfully grown gallium oxide. With its ultra-wide bandgap properties, gallium oxide is regarded as a crucial material for next-generation high-power electronic components. Through a specially designed molten growth technique, the center's research team has developed high-quality gallium oxide crystals. Moving forward, the center will collaborate with domestic and international industry partners to accelerate commercialization and technology transfer, promoting the application of SiC and gallium oxide (Ga_2O_3) in semiconductors, optics, lasers, and medical technologies, thereby enhancing Taiwan's global competitiveness.



(Left) 6-inch 4H-SiC single crystal wafer and natural SiC mineral (carborundum)
(Center) Ga_2O_3 single crystal
(Right) Various scintillation crystals

Connecting with Industry

Professor Mitch Ming-Chi Chou, Director of the NCKU Center of Crystal Research, stated that the establishment of the center has garnered significant attention from the academic community and strong support from leading domestic and international companies. Among them, Largan Precision Group, one of the world's leading smartphone camera lens suppliers, has invested tens of millions of dollars to establish state-of-the-art equipments for crystal growth and has provided additional funding to develop the growth technology of gallium oxide. This investment has expanded the scale of research by three times, further strengthening Taiwan's leadership in global crystal technology. Additionally, Largan Precision and its subsidiary, Taiwan Applied Crystal Corp., will join the NCKU Academy of Innovative Semiconductor and Sustainable Manufacturing and conduct research on SiC epitaxial growth. Breakthrough technological advancements are expected within the next three years.

International Impact

In addition to industry-academia collaboration, the NCKU Center of Crystal Research is actively expanding its international academic influence. It has established two oversea research centers in Lithuania and Latvia, working with the local teams to develop high-power thin-disk laser (TDL) systems, achieving significant technological advancements. This technology is expected to be applied in advanced laser medical treatments, precision manufacturing, and optical communications, further strengthening Taiwan's competitive edge in the global crystal technology fields.

Prof. Mitch Ming-Chi Chou, Director of the NCKU Center of Crystal Research, guiding the guests through the Crystal Science Museum and large-size silicon carbide (SiC) crystal growth furnaces.

Future Vision

In the future, TCECM will further integrate major equipment currently available in Taiwan, including synchrotron radiation facilities, neutron scattering instruments, and electron microscopes, while strengthening collaboration with theoretical scientists.

Through these efforts, TCECM aims to build a research team focused on advanced materials with Taiwanese characteristics and to establish a Taiwanese brand in the global materials science community under the vision of Materials@Taiwan.

Condensed matter physics in New Zealand

We (too) come from a land down under – an intro to condensed matter physics in New Zealand

The condensed matter physics community in New Zealand is small and widely separated, but our separation - across several universities and CRIs (Crown Research Institutes – think CSIRO but split into 7 institutions, soon to merge into 3) - has not prevented us from building those close links that lead to rewarding and excellent scientific careers. The smaller size of our physics departments and research centres means too that the resources and facilities needed are not often all available in any one place, and it's one of those distinctive features of NZ physicists that we have become very good at sharing and supporting one another.

Institutions

NZ condensed matter physicists are located mostly within the universities that have academic schools of physics – chiefly the University of Otago https://www.otago.ac.nz/physics/research, University of Canterbury https://www.canterbury.ac.nz/study/academic-study/science/-science-research/physical-and-chemical-sciences-research, Victoria University of Wellington https://ww-w.wgtn.ac.nz/scps and Auckland University https://www.auckland.ac.nz/en/science/about-the-facul-ty/department-of-physics/physics-research.html. The research-focused Paihau-Robinson Research Institute https://www.wgtn.ac.nz/robinson at

Victoria University of Wellington and Massey University's Institute for Advanced Study https://www.nzias.ac.nz/index.html are also hosts to condensed matter physics research. Outside the universities, there are clusters within the CRI GNS Science, around the van de Graaf particle accelerator at the Rafter Research Centre https://www.gns.cri.nz/part-ner-with-us/labs-and-facilities/ion-beam-materials-and-analysis-laboratory/, and the Measurement Standards Lab https://www.measurement.govt.nz/, New Zealand's national metrology institute. With our small numbers at any one location, however, condensed matter physicists and physics research are most importantly organized within some nation-wide networks. The predominant organization for condensed matter physics in NZ is **Te Mana Tangata Whakawhanake – the MacDiarmid Institute for Advanced Materials and Nanotechnology** https://www.macdiar-mid.ac.nz/. The MacDiarmid Institute is one of a number of Centres of Research Excellence (CoREs), very similar to the Australian Research Council (ARC) Centres of Excellence, supporting a geographically-dispersed network of researchers and postgraduate students.

Established in 2002 as one of the first CoREs and named after late chemistry Nobel laureate Prof. Alan MacDiarmid, the MacDiarmid Institute was formed as a multi-disciplinary collaboration between materials-focused physicists – and some chemists –at Victoria University of Wellington and the University of Canterbury in Christchurch. Since then the MacDiarmid Institute has survived 3 successive contestable rounds and has grown to include Investigators in physics, chemistry, biology, engineering, materials science and sustainable materials based on mātauranga Māori (the knowledge and world view of the Māori people), involving also the Universities of Otago and Auckland, Massey University, Auckland University of Technology and the Geological and Nuclear Sciences CRI. The MacDiarmid Institute's research is across 4 programmes; Future Computing, Reconfigurable Systems, Mātauranga Māori and Catalytic Architectures. Condensed matter physicists are involved in all programmes, but most concentrated in the first two, with strengths in nanoparticles and nanowire networks, high temperature superconductivity, spintronics and magnetic materials, thin film growth, and oxide semiconductors.

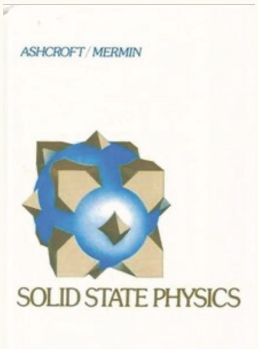
A second CoRE that includes condensed matter physics research is **Te Whai Ao - the Dodd-Walls Centre for Photonic and Quantum Technologies** https://www.doddwalls.ac.nz/. The Dodd-Walls Centre, first funded in 2015, is organized around three research 'Beacons' – quantum systems and sensing; many-body systems; and optical imaging, spectroscopy and sensing. The Dodd-Walls Centre also manages Quantum Technologies Aotearoa https://qta.otago.ac.nz/, a strategic research project supporting NZ to foster international collaborations in quantum technologies.

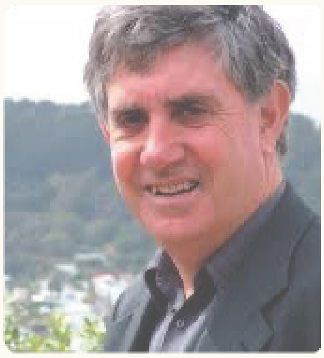
Also important is the New Zealand Institute of Physics (NZIP) https://nzip.org.nz/, the institute for professional physicists, which includes college teachers, university lecturers, students studying to be physicists, CRI scientists, industry scientists and more. NZIP has 100-120 professional members and a very strong community of physics teachers, amounting to 350 of the ~375 secondary schools in New Zealand.

Some important and influential NZ physicists

There's obviously **Ernest Rutherford** https://teara.govt.nz/en/biographies/3r37/rutherford-ernest, the 1908 Nobel laureate (though it was the chemistry Nobel) who memorably 'split the atom'. He was born in Nelson and educated in Christchurch before moving to Cambridge and then Canada, and his work studying radioactive decay largely established the model of nuclear structure essential to condensed matter and atomic physics today. In NZ we honour him by naming many scientific fellowships after him and he is on the NZ$100 bill. Another Ernest, **Sir Ernest Marsden** https://teara.govt.nz/en/biographies/4m41/marsden-ernest, worked with Rutherford on his famous gold-foil experiment and was later instrumental in setting up NZ's government science organization, the since restructured-out-of-existence Department of Scientific and Industrial Research DSIR. NZ's pre-eminent investigator-led research fund, the Marsden Fund, is named after him. **Neil Ashcroft** https://www.roy-alsociety.org.nz/who-we-are/our-people/our-fel-lows/obituaries/obituaries-of-honorary-fellows/professor-neil-ashcroft-hon-frsnz/, co-author of Solid State Physics (aka 'Ashcroft & Mermin', the textbook recognized by most condensed matter physics students around world), moved to NZ when he was a child, and he was a major supporter of condensed matter physics in NZ, with special research interests in the high temperature superconductivity research here, as well as involvement in the MacDiarmid Institute. Lastly, Sir Paul Callaghan was a world-leading physicist in nuclear magnetic resonance and one of NZ's most prominent and influen-tial scientists in recent times. He used his combination of top-level science talent and strong advocacy for NZ science and environmental issues to get a lot of cut through with scientists, government and the public. Sir Paul's views and ideas are still at the centre of conversations today about how science can benefit NZ, over 10 years after his untimely death.





Left to right – Ernest Rutherford; Sir Ernest Marsden; Solid State Physics; Neil Ashcroft; Sir Paul Callaghan

BIO

Institutional connections to Australia

Many NZ-based condensed matter physicists naturally have close collaborations with those in Australia. Apart from the personal connections, there are strong institutional links to Australia's important facilities as well. New Zealand pays to support the Australian Synchrotron, such that NZ researchers are able to take advantage of dedicated access to beamtime https://synchrotron.royalsociety.org.nz/, and NZ researchers make sufficient use of the Lucas Heights OPAL research reactor that the biennial ANBUG-AINSE Neutron Scattering Symposium (AANSS) is officially the symposium of the Australian and New Zealand neutron scattering community. NZ Centres of Research Excellence have had partnership arrangements in the recent past, including with the ARC Centre of Excellence Future Low-Energy Electronics Technologies FLEET and the Australian National Fabrication Facility ANFF.

Future Endeavours

As of March 2025 the NZ science and university sectors are entering a period of considerable change, with major reviews of both currently under way. While there is consternation that some areas of research, particularly the humanities and social sciences, have lost resources, the natural and applied sciences have reason to be cautiously optimistic. Changing government priorities - towards space and Earth observation, biotechnologies and quantum technologies - may present opportunities for condensed matter physics in the near future, as well as with the planned establishment of a new Public Research Organisa-tion on advanced technologies. Whatever the results, NZ condensed matter physicists will continue doing what they do best, and anticipating the day that a NZ team can finally defend that 2020 win of the Lindsey Davis Cup.

If you are interested in making a connection to the NZ condensed matter physics community

Dr Simon Granville
simon.granville@vuw.ac.nz
Principal Scientist, Robinson Research Institute, Victoria University of Wellington
Principal Investigator and Programme Leader, MacDiarmid Institute for Advanced Materials and Nanotechnology
Council Member and IUPAP representative, New Zealand Institute of Physics

Selected Contributions on Condensed Matter Physics in the Asian Pacific Areas

Report A

Title: Pseudogap and electronic rotons induced by the short-range order of dopants

Subtitle: The short-range order of dopants on a two-dimensional insulator is responsible for the pseudogap and the rotonic band dispersion.

Authors: Soobin Park & Keun Su Kim
Department of Physics, Yonsei University, Seoul 03722, Republic of Korea

Abstract: Emergent quantum phenomena, such as high-temperature superconductivity [1], have been found in a two-dimensional (2D) crystalline insulator doped by foreign atoms (dopants). Although these dopants were often ignored in theoretical models for the sake of brevity, it is true that they remain in actual materials. More importantly, these dopants seem to be randomly distributed, but in fact there can be a short-range order arising from repulsive interactions between 2D dipoles consisting of doped electrons and ionic dopants. This short-range order of 2D dipoles is responsible for the pseudogap [2] at the Fermi level and the anomalously aperiodic (roton-like) dispersion relation [3].

Main text:

Doping to a crystalline insulator is not only at the heart of semiconductor technologies, but it leads to novel quantum phenomena, such as high-temperature superconductivity [1]. It is well known that the high-temperature superconductivity emerges in two-dimensional (2D) layered crystalline insulators doped by some other kind of atoms (dopants). Although these dopants have been mostly neglected in theoretical models for the sake of simplicity (assuming that they may not affect the physics of this system seriously), it is true that they remain in actual materials. More importantly, these dopants seem arbitrarily distributed at first glance, but if one takes a closer look, there can be a short-range (crystalline) order of dopants arising from repulsive interactions between doped electrons and/or ionic dopants.

Black phosphorus is one of the elemental 2D crystalline insulators. The crystal structure of black phosphorus has the honeycomb network of phosphorus atoms (as in graphene), but it is regularly modulated to be armchair-shaped in one in-plane direction as shown in Fig. 1a (balls and sticks). This so-called puckered honeycomb structure of black phosphorus makes its low-energy electronic structure insulating with the conduction band minimum and the valence band maximum located at the zone center with the moderate band gap of 0.34 eV [4]. Different from graphene, the low-energy bands located at the zone center make black phosphorus an ideal system to study how the short-range order of dopants would affect the low-energy electronic structure.

We first prepare the clean surface of bulk black phosphorus by cleaving in the ultrahigh vacuum. On the sample held at the temperature below 100 K, we deposit dopant atoms by repeating the cycle of thermal evaporation up to the density less than 1 monolayer (ML). It is well known by first principles calculations and core-level photoemission spectroscopy that the deposited dopant atoms energetically prefer to remain on the surface rather than penetrating in the bulk [5]. For the case of alkali metals on black phosphorus, each alkali-metal atom donates an electron to black phosphorus, being ionized due to the difference in their electron affinities. To screen the potential of the positively charged alkali-metal ions, doped electrons in black phosphorus are concentrated near the surface. This in turn forms a 2D dipole that consists of doped electrons and dopant ions, as illustrated in Fig. 1a. Angle-resolved photoemission spectroscopy (ARPES) data taken for this system in Fig. 1b shows a reduction in the energy gap between the conduction band minimum (blue open circles) and the valence band maximum (red open circles) [4]. This is the so called giant Stark effect, which is clear evidence for the formation of 2D dipoles in Fig. 1a.

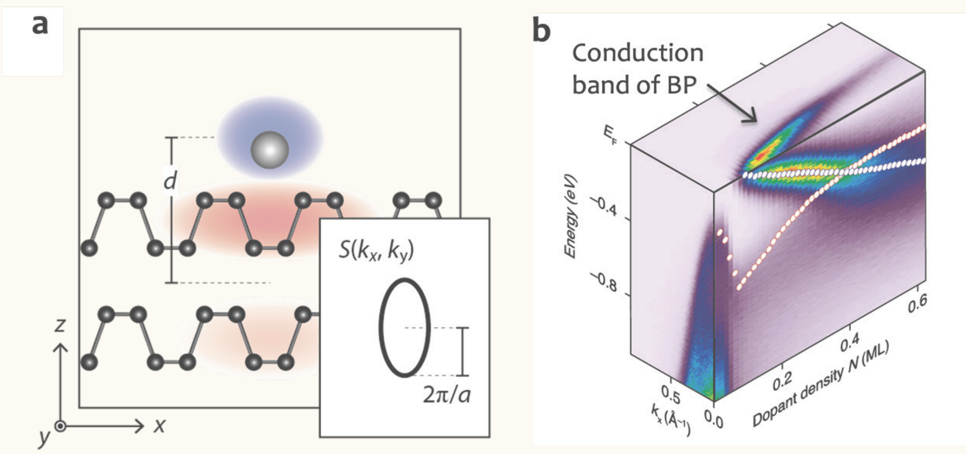


Figure 1 | a, Schematics for an alkali metal (grey ball) on black phosphorus (balls and sticks). They form the 2D dipole of doped electrons (red) and dopant ions (blue). b, ARPES data of black phosphorus whose surface is doped by potassium. It shows a reduction in the energy gap between the conduction band minimum (blue circles) and the valence band maximum (red circles) with increasing the dopant density due to the giant Stark effect [4].

Black phosphorus consists of 2D van der Waals layers with no chemically active dangling bond at the surface. For this reason, the diffusion barrier for dopant atoms on the surface of black phosphorus at the density less than 0.5 ML is known to be extremely low even at low temperatures [5]. The scanning tunneling microscopy (STM) topographic image taken for the K atoms as deposited on black phosphorus at 4 K shows that they are aggregated. However, once we anneal this sample at 15 K, K atoms migrate on the surface as in a liquid state even at such a low temperature, so that they are distributed with an average distance between dopants. The fast Fourier transform of this STM image reveals an anisotropic ring-shape structure factor as shown in inset of Fig. 1a. This set of broad peaks in the structure factor resulting from the average distance between dopants is exactly what we mean by “short-range order”. Note that this short-range order is a result of repulsive interactions between 2D dipoles. This system can thus be mod-elled as a 2D dipole liquid, making it an ideal sustem to study the effect of short-range order to the electronic structure.

The low-energy electronic structure of black phosphorus doped by alkali metals at the density of 0.36 ML can be better modeled by 2D nearly free electrons under the influence of multiple scattering by the potential of dopant ions [6]. Since there is a short-range order of dopants with the average interatomic distance of a, resonance scattering occurs at the k position close to ˜/a, where the real part of ˜k makes a sinusoidal distortion in the band dispersion as shown in Fig. 2a. The imaginary part of ˜k makes a broadening in k (as shown by the grey envelop in Fig. 2a), which can be translated into the real-space localization of electron waves near dopants. This renormalization forms a dip in the density of states as shown in inset of Fig. 2a, which corresponds to the pseudogap first coined by N. Mott [7]. This pseudogap and back-bending dispersion could be clearly observed in our ARPES data as shown in Fig. 2b,c [2].

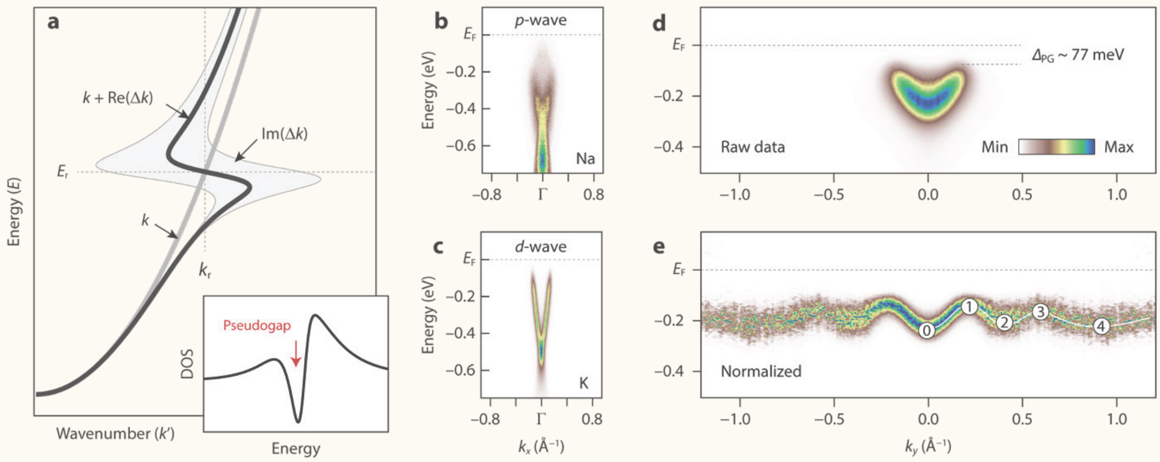


Figure 2 | a, Band renormalizations predicted in theory for the electronic structure of liquid metals by the effect of short-range order [6]. Inset shows the density of states calculated from a. b,c, ARPES data of black phosphorus doped by Na (b) and K (c) at 0.36 ML taken in the armchair direction [2]. d, ARPES data of black phosphorus doped by K at 0.08 ML taken in the zigzag direction [3]. e, Normalized data of d showing the aperiodic dispersion.

On the other hand, if the density of dopants is much lower than 0.36 ML, the low-energy band structure of black phosphorus doped by alkali metals can be modeled by a quantum fluid of 2D dipoles rather than 2D electrons under the influence of multiple scattering. This is because at such a lower density the doped electrons are far apart in the lateral direction and can be regarded as a mass-anisotropic 2D dipole system or an electron-hole bilayer [3]. This short-range order in the quantum fluid of 2D dipoles leads to the aperiodic dispersion not only in an excitation spectrum, but also in a single-particle spectrum [8]. This is similar to the characteristic spectrum of rotons first introduced by Landau to explain superfluidity in liquid helium 4 [9]. This aperiodic band dispersion could be clearly observed in our ARPES data taken from black phosphorus doped by potassium at the density of 0.08 ML as shown in Fig. 2d,e.

Taken together, our ARPES studies on black phosphorus doped by alkali metals indicate that the short-range crystalline order of dopants is the common origin for the pseudogap [2] and the aperiodic (rotonic) band dispersion [3]. An important lesson learned from these findings is that dopants left in the system, which have been ignored in theoretical models, should be carefully considered in describing the mechanism of quantum phenomena in the doped 2D (layered) crystalline insulators. This short-range order that affects the electronic structure may be formed not only by dopant atoms, but also by charges or spins. As many of high-temperature superconductors contain alkali earth metals as dopants, it would also be interesting to study the short-range order of alkali earth metals in the future.

References:

[1]. B. Keimer et al., Nature 518, 170-186 (2015).

[2]. S. H. Ryu et al., Nature 596, 68-73 (2021).

[3]. S. Part et al., Nature 634, 813-817 (2024).

[4]. J. Kim et al., Science 349, 723-726 (2015).

[5]. B. Kiraly et al., Phys. Rev. Lett. 123, 216403 (2019).

[6]. P. W. Anderson and W. L. McMillan, Proceedings of the International School of Physics Enrico Fermi Course 37 (Academic, New York, 1967).

[7]. N. Mott, Phil. Mag. 19, 835 (1968).

[8]. A. Filinov et al., Phys. Rev. A 86, 043628 (2012).

[9]. L. Landau, Phys. Rev. 60, 356-358 (1941).

Report B

Title: Dark excitons unlock efficient photon upconversion

Subtitle: Efficient light upconversion via resonant exciton-exciton annihilation of dark excitons in atomically thin semiconductors.

Authors: Shao-Yu Chen[1-4], Yi-Hsun Chen[4,5], and Shun-Jen Cheng[6]

[1]Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan

[2]Center of Atomic Initiative of New Materials, National Taiwan University, Taipei, Taiwan

[3]Institute of Physics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan

[4]Australian Research Council Centre of Excellence in Future Low-Energy Electronics Technologies (FLEET), Monash University, Clayton, Victoria 3800, Australia

[5]School of Physics and Astronomy, Monash University, Clayton, Victoria 3800, Australia

[6]Department of Electrophysics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan

Abstract:

Upconversion photoluminescence (UPL), the emission of photons with energies higher than the excitation light, has emerged as a promising approach for generating high-energy photons in applications ranging from bioimaging to energy harvesting. While prior demonstrations have relied on rare-earth-doped materials or molecular systems, challenges remain in achieving durable, efficient, and semiconductor-compatible platforms.

Here, efficient light upconversion in few-layer transition metal dichalcogenides (TMDs) via exciton-exciton annihilation (EEA) of dark excitons is reported. In this process, two momentum-indirect dark excitons merge to form a higher-energy exciton at the Ɣ valley, which radiatively emits a photon exceeding the excitation energy. Such upconversion occurs under low-power continuous-wave excitation and is highly tunable by material type and the number of layers, yielding emission from green to near-ultraviolet wavelengths. These findings position atomically thin TMDs as promising solid-state candidates for scalable, energy-efficient upconversion technologies.

Main text:

Light plays a vital role in modern life, from enabling vision to powering solar technologies. Different applications rely on photons of varying energies: ultraviolet (UV) light is commonly used for disinfection; visible light gives color to our surroundings; and infrared radiation, although abundant, is often underutilized due to its low photon energy. Typically, when light interacts with matter, it loses energy, resulting in lower-energy emissions or heat. However, reversing this process, by converting low-energy photons into higher-energy ones, is known as photon upconversion. This phenomenon has the potential to significantly enhance the efficiency of various light-based technologies. In this study, a collaborative research team from across the Asia-Pacific region—including Dr. Shao-Yu Chen at National Taiwan University, Dr. Yi-Hsun Chen at Monash University, Prof. Shun-Jen Cheng at National Yang Ming Chiao Tung University, and their collaborators—investigated the upconversion effect in atomically thin semiconductors known as two-dimensional (2D) transition metal dichalcogenides (TMDs). [1] Utilizing upconversion photoluminescence (UPL) spectroscopy, they found that common 2D semiconductors such as MoS2, MoSe2, WS2, and WSe2 can absorb low-energy red or infrared light and emit much higher-energy light, even reaching the near-ultraviolet range, under simple room-light or low-power laser excitation.

To uncover the mechanism behind this behavior, the team collaborated closely with theoretical physicists from National Yang Ming Chiao Tung University and Tamkang University. Their analysis revealed that a novel upconversion process which is driven by a many-body interaction known as exciton-exciton annihilation (EEA). In this process, two intervalley dark excitons, quasiparticles formed from bound electrons and holes that do not emit light directly, combine their energy. As illustrated in Figure 1, when these inter-valley excitons possess opposite momentum, they can annihilate and convert into a single, higher-energy bright exciton with vanishing momentum, which subsequently emits a photon with energy exceeding that of the excitation source.

This EEA process is particularly efficient in 2D semiconductors due to their strong excitonic effects, which arise from reduced dielectric screening and enhanced Coulomb interactions at the atomic scale. Moreover, these materials offer a rich excitonic landscape due to their unique electronic band structures, especially at the ɣ point in momentum space where bright excitons can efficiently emit light.

What makes this process especially attractive for real-world use is its compatibility with continuous-wave (CW) low-power lasers, in contrast to second harmonic generation (SHG) or other nonlinear optical processes that typically require high-intensity pulsed lasers. This allows upconversion to occur under ambient conditions and at low energy cost.

Additionally, the upconversion emission found in TMDs is highly tunable. By varying the number of atomic layers and selecting different chemical compositions, the researchers could shift the upconverted photon energy across a broad range, from green (~2.34 eV) to near-ultraviolet (~3.1 eV), as shown in Figure 2. This tunability stems from the layer-dependent energy levels of dark excitons, influenced by interlayer Coulomb interactions and quantum confinement effects.

These results establish atomically thin TMDs as promising solid-state platforms for practical, scalable, and energy-efficient upconversion applications. The findings open exciting opportunities for advanced optoelectronic devices, improved energy conversion systems, and new directions in bio-imaging and nanoscale light manipulation.

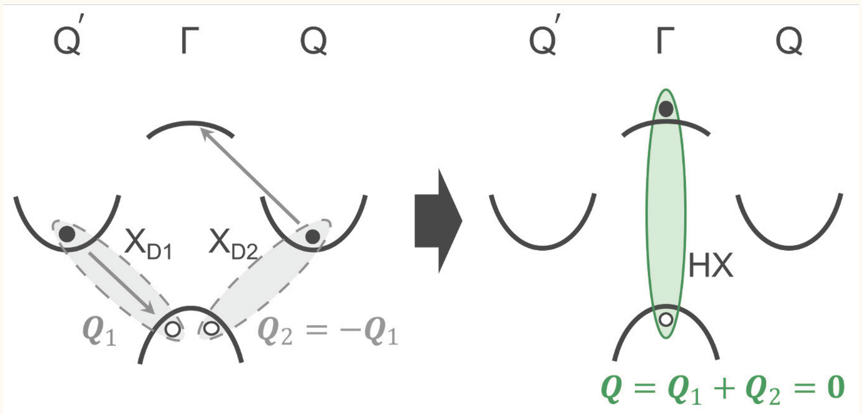


Figure 1. A schematic representation of excitonic upconversion before (left panel) and after (right panel) the electron-scattering process, which is indicated by grey arrows.

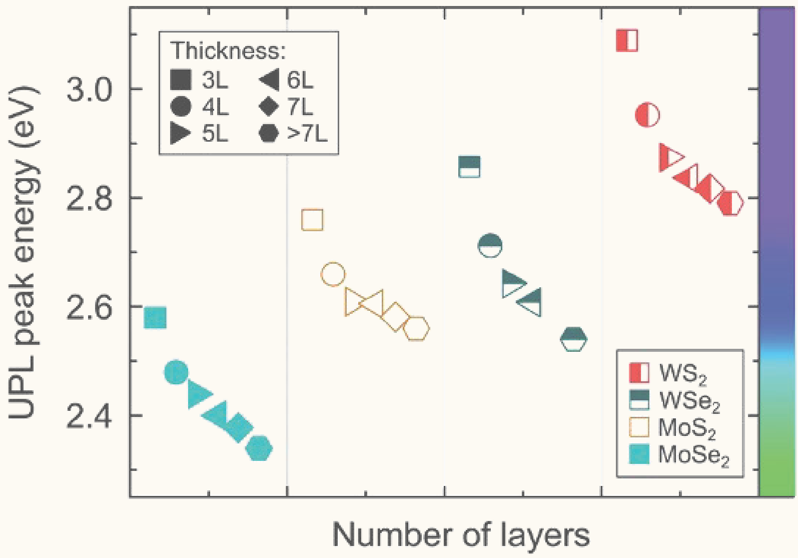


Figure 2. Peak energy of UPL in MoS2 (open), MoSe2 (solid), WS2 (half left), and WSe2 (half up) with the layer thickness ranging from 3L to 7L, and thicker than 7L.

References:

1. Chen, Y.-H. et al. Efficient light upconversion via resonant exciton-exciton annihilation of dark excitons in few-layer transition metal dichalcogenides. Nat. Commun. 16, 2935 (2025).

Recent Academic Exchanges and Activities in the Asian Pacific Areas

International Symposium in Physical Society of Japan (JPS) Annual Meeting

“Recent progress in topological matters"

JPS is going to organize a few international symposiums in the Annual Meeting in Hiroshima University between September 16 to 19, 2025. In condensed matter physics, the title will be “Recent progress in topological matters”. Three confirmed oversea speakers are Prof. Jan Seidel (University of New South Wales), Prof. Tse-Ming Chen (Cheng Kung University) and Prof. Jun Sung Kim (Pohang University of Science and Technology). The deadline for 15 minutes contributed talk submission is July 3rd. The early bird registration fees are 8000 JPY and 4000 JPS for JPS ordinal member and JPS student member, respectively. For the members of societies with reciprocal agreement, the JPS member prices will apply. The fees for non-member are 20000 JPY and 6000 JPY for non-student and student, respectively. We welcome your participation to the symposium and JPS annual meeting. https://www.jps.or.jp/english/meetings-and-awards/annual/annual-index.html

Advanced Materials and Nanotechnology conference

The main event for condensed matter physics in NZ is the 2-yearly AMN – Advanced Materials and Nanotechnology conference, run by the MacDiarmid Institute. This conference spans the full range of research covered by the MacDiarmid Institute, including commercialisation and outreach, and has always been scheduled to occur in the alternate years to Australia's ICONN International Conference on Nanoscience and Nanotechnology. AMN moves around the country, with previous instances in Wellington, Auckland, Rotorua, Nelson and Queenstown, and the 11th AMN https://www.macdiar-mid.ac.nz/news-and-events/events/amn11-otautahi-christchurch-9-13-february-2025/ took place in February 2025 in Christchurch. The conference typically has 400-500 attendees with 40-50% from overseas, including many from Australia. Keynote and invited speakers from the Australian condensed matter physics community at AMN-11 included Profs Jared Cole, Kirrily Rule and Julie Karel. AMN-11 also featured a special symposium on Neuromorphic, unconventional and physical computing. I started my PhD the day AMN1 finished in 2003 and I've attended 8 of them since.

AMN is an excellent conference to immerse yourself in the broad range of topics covered, and its longevity means a substantial group of internationals return every year. It has proven to be important for students in the region as well - in an age of flygskam https://en.wikipedia.org/wiki/-Flight_shame ('flight shame', the social pressure or guilt felt about flying by environmentally-conscious travellers), constrained travel budgets and tightened travel visas for many countries, the AMN conferences are a friendly venue for a first international conference experience. For many condensed matter physicists in NZ it is a highlight of the year, giving us a chance to catch up with the NZ and Asia-Pacific community, just before NZ funding proposal deadlines in late Feb and early March, and the university trimester commencing.

AMN-11 venue and opening ceremony, Christchurch, 9 Feb 2025.

The biannual NZIP Conference https://confer.eventsair.com/nzip2025/, occurring in the same years as AMN, regularly has between 150 and 200 attendees. This conference includes all areas of NZ physics as well as incorporating PHYSIKOS, the New Zealand Physics Teachers' Conference, such that condensed matter physics is a smaller part of proceedings – however this conference is regularly attended by some in the community, especially university physicists maintaining their links to secondary physics teachers. The next NZIP/PHYSIKOS is scheduled for 1-3 July 2025 in Auckland, with topics to cover physics research, education and curriculum development, and the awarding of the NZIP awards at a post-conference dinner. The Australian Institute of Physics' Condensed Matter and Materials 'Wagga' conference is, every 5 years or so, held in New Zealand, with the last taking place in Rotorua in February 2020. I'm honored to have been part of the (New-Zealand-led) team that won the conference quiz and the Lindsey Davis Cup, though as the trophy itself wasn't brought across the Tasman, the team was entrusted with an official two-dimensional reproduction of the Cup.

Lindsey Davis Cup winning team at the 44th Wagga Conference in Rotorua, 5 Feb 2020

Finally, other events are held on smaller scales where condensed matter physicists can be found. Both the MacDiarmid Institute and Dodd-Walls Centre have annual research programme meetings and symposiums, to which guests (often Australians) are invited. The MacDiarmid Institute also runs 'Cluster hui', meetings on focused research topics. In June 2024 was a Thin Films Hui at Ohakune in the skiing part of the central North Island, and in December 2022 was the Physics Symposium in Honor of Prof. Joe Trodahl's 80th birthday in Nelson – both events had Australian physicists attending and speaking also.

DCMP Information

New Website of the DCMP

The website of the DCMP is renewed and the URL have been changed to https://www.dc-mp-aapps.org/. The new website is secure https website with improved access speed. All new information is posted in the new website. Please access it! We prepare the submission of new membership by using google form and Microsoft forms. Please distribute this information so that more researchers will join DCMP.

Call for the DCMP Young Scientist Award 2025

The DCMP announce the call of the DCMP Young Scientist Award to honor young researchers with excellent research achievements. The award is organized by the division of condensed matter physics (DCMP) of AAPPS. The DCMP encourage all young researchers working in Asia-Pacific region to apply the award.

Eligibility

1. The awardee must have obtained a PhD in physics or an equivalent degree no more than 8 years prior to the date of nomination.
2. The awardee must have done the work to be awarded when one had an affiliation to an institution in the AAPPS member country region.
3. The awardee must have an affiliation to an institution in a member country region at the time of nomination. The awardee must be the member of the DCMP.

Channel of Nominations

Nomination is requested to submit by the recommender and no self-nomination is accepted.
All regular DCMP member can recommend one candidate every year.

Selection Process

The selection will be made in two-steps processes.

1. Selection of the several final candidates by the review of the application documents.
2. Presentation at the DCMP annual conference-AC2MP and the final decision (A part of the registration fee may be waived for the finalists).
3. The award consists of one gold medal and a few silver medals. The numbers may depend on number of applicants and finalists.
4. A selection committee appointed by the DCMP shall determine the recipient of the prize from the nominations taking into account 1) the overall quality and 2) significance of the contribution and 3)the creativity and originality exhibited in the contribution. The prizes will be presented at the DCMP annual meeting.

Nomination Deadline and format

1. Nominations deadline is May 31st 2025.
2. To reduce the road of applicant, we use a similar format with AAPPS CN-Yang award.

Please note that there are a few important differences.

3. Nomination package should include.
   a. Letter of Recommendation not more than 2 pages explaining the achievements and the activity and the potential of the nominee
   b. C. V. (including contact information and biographical information). Please show that you are eligible for this award.

The nominee's publication list, including the URL (DOI) information of the five of the nominee's c. foremost publications can be retrieved. Listing of the citations of nominee's important publications is also preferred and d. Description of achievements written by nominee within 2 pages.

The impact, novelty, and originality of achievement as well as the independence of the nominee must be stated.

Important note

The winner of CN-Yang award is not eligible for the DCMP award. We accept the application by the applicant for CN-Yang award. i.e. One can apply for both awards in same Submission All documents must be packed into single PDF file and send to dcmp.aapps@gmail.com

News

YITP has been designated as an International Joint Usage/Research Center

Yukawa Institute for Theoretical Physics (YITP) at Kyoto University has been designated as an International Joint Usage/Research Center by the Ministry of Education, Culture, Sports, Science and Technology. This designation is based on the institute's track record as a national joint usage institute and Joint Usage/Research Center, as well as the evaluation of its international collaborative research framework. Going forward, we aim to further promote collaboration with researchers both domestically and internationally, contributing to the advancement of theoretical physics.

In condensed matter physics-materials science related fields, GIMRT of Institute for Materials Research, Tohoku University and Institute for Chemical Research, Kyoto University had been designated as International Joint Usage/Research Center in 2018. These three institutes are working as the gateway of international research collaboration in the condensed matter physics and related fields.

Announcement in YITP web site
https://www.yukawa.kyoto-u.ac.jp/research/r400?lang=en-GB

DCMP-AAPPS Launches Official LinkedIn Page

We're excited to announce that the DCMP now has its official LinkedIn page! This new channel will help us share the latest news, research highlights, events, and opportunities within our condensed matter physics community across the Asia-Pacific region. Feel free to follow the page **here** and use it as a platform to build professional connections, exchange ideas, and foster collaboration among condensed matter physicists throughout our region and beyond.