

PRISM2022 Scientific Program

(Pacific Rim International Conference on Superconducting Materials :
Fundamentals and Applications)

22nd - 23rd September, 2022

*ACCMS Global Research Centre, SRM Institute of Science and Technology,
Chennai, India*

and

New Industry Creation Hatchery Center, Tohoku University, Sendai, Japan

Overview Talk	60 min, including discussion
Keynote Talk	60 min, including discussion
Invited Talk	30 min, including discussion
Poster Presentation	3 min, Video presentation

22nd September, 2022(Thursday)

(Opening time: 10:00 Japan, 9:00 China, 6:30 India, 2:00 London, 21:00[21st night] Washington)

10:00-10:20

[Inauguration](#)

Welcome Note: V. J. Surya, ACCMS-GRC, SRMIST

Welcome Address: Y. Kawazoe, Head, ACCMS-GRC, SRMIST

Presidential Address: T. V. Gopal, Prof. Dean CET, SRMIST

Release of the Abstract Book

Vote of Thanks: Yuvaraj Sivalingam, ACCMS-GRC, SRMIST

Session I: 10:20-11:20

History of High-Tc Superconductor

Chair: John Boeckl

10:20-11:20 (Overview)

["Superconductivity: One Hundred Years to Reach Room Temperature"](#)

Warren Pickett

University of California Davis

Session II: 11:20-13:50

High Tc Superconductors

Chair: Xiao Hu

- 11:20-11:50 (Invited-1) **“Nanofabricated High Transition Temperature Superconductor Josephson Junctions”**
Shane A. Cybart
Department of Electrical and Computer Engineering, University of California Riverside
- 11:50-12:20 (Invited-2) **“Enhanced Electrophoretically Deposited $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ Films via Particle Size Optimization”**
Maricar M. Rosete
*Department of Mining, Metallurgical and Materials Engineering
 University of the Philippines Diliman*
- 12:20-12:50 (Invited-3) **“SUPERCONDUCTIVITY AND GRAIN COUPLING BEHAVIOUR OF $\text{Bi}_2\text{Sr}_{2-x}\text{In}_x\text{CaCu}_2\text{O}_{8+\delta}$ (In-DOPED Bi-2212) BULKS AND FILMS**
Francesca Isabel N. de Vera^{1,2*}, Bess G. Singidas² and Roland V. Sarmago
¹ *Institute of Mathematical Sciences and Physics, University of the Philippines – Los Banos Laguna,*
² *National Institute of Physics, University of the Philippines – Diliman*
- 12:50-13:20 (Invited-4) **“Molecular dynamics simulations of radiation damage in $\text{YBa}_2\text{Cu}_3\text{O}_7$ ”**
R. Gray¹, M. J. D. Rushton² and S. T. Murphy^{1*}
¹ *Engineering Department, Lancaster University, Bailrigg, Lancaster, LA1 4YW, UK*
² *Nuclear Futures Institute, Bangor University, Bangor, Gwynedd LL57 2DG, UK*
- 13:20-13:50 (Invited-5) **“Superconductivity in Infinite Layer Nickelates”**
 Lin Er Chow,¹ K. Y. Yip,² M. Pierre,³ S. W. Zeng,¹ Z. T. Zhang,¹ T. Heil,⁴ J. Deuschle,⁴ P. Nandi,¹ S. K. Sudheesh,¹ Z. S. Lim,¹ Z. Y. Luo,¹ M. Nardone,³ A. Zitouni,³ Peter A. van Aken,⁴ Elbert E.M. Chia,⁵ M. Goiran,³ S. K. Goh,² W. Escoffier,³ A. Ariando^{1*}
¹ *Department of Physics, Faculty of Science, National University of Singapore, Singapore 117551, Singapore*
² *Department of Physics, The Chinese University of Hong Kong, Shatin N.T., Hong Kong SAR, China*
³ *LNCMI, Université de Toulouse, CNRS, INSA, UPS, EMFL, 31400 Toulouse, France*
⁴ *Max Planck Institute for Solid State Research, 70569 Stuttgart, Germany*

⁵*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, 21 Nanyang Link, Singapore 637371, Singapore*

13:50-14:20 Break

Session III: 14:20-17:20 Unconventional Superconductors

Chair: Shen V. Chong

14:20-14:50 (Invited-6)

“Telltale Diamagnetism above 50 K of a Coordination Polymer System”

Zhengtao Xu

Institute of Materials Research and Engineering, 2 Fusionopolis Way, Innovis Building, Singapore 138634

14:50-15:20 (Invited-7)

“Doping-induced polar-nonpolar structural phase transition and enhancement of superconductivity in platinum pnictides”

Kazutaka Kudo

Department of Physics, Osaka University, Toyonaka, Osaka 560-0043, Japan

15:20-15:50 (Invited-8)

“Cooper approach to pair formation in a tight-binding model of La-based cuprate superconductors”

K.M.Frahm¹, D.L.Shepelyansky^{2*}

¹*Laboratoire de Physique Theorique,*

²*CNRS, UPS, Toulouse, France*

15:50-16:20 (Invited-9)

“Superconductivity emerging from a stripe charge order in IrTe₂ nanoflakes”

Jun Sung Kim

Department of Physics, Pohang University of Science and Technology, Korea

16:20-16:50 (Invited-10)

“Electron-phonon interaction and superconductivity in twisted graphene layers”

Hyoung Joon Choi

Department of Physics, Yonsei University, Seoul 03722, Korea

16:50-17:20 (Invited-11)

“Inherited topological superconductivity in two-dimensional Dirac semimetal”

Hoi Chun Po

*Department of Physics, Hong Kong University of Science and Technology,
Clear Water Bay, 999077, Hong Kong, China*

17:20-17:30 Break

Session IV: 17:30-18:30 Heterostructures

Chair: Saeed Bahramy

17:30-18:00 (Invited-12) **“Superconductors in quantum computers and the various novel aspects of a new elemental superconductor”**

Bhupendra N. Dev

*Centre for Quantum Engineering, Research and Education (CQuERE)
TCG Centres for Research and Education in Science and Technology,
Kolkata 700091, India*

18:00-18:30 (Invited-13) **“Metal oxide-based organic-inorganic layered hybrids with electron-rich spacer molecules”**

Shen V. Chong*, J. L. Tallon

*Robinson Research Institute, School of Engineering, Victoria University of
Wellington, Wellington, New Zealand*

18:30-19:30 Poster Presentations

Chair: V. J. Surya **24 posters each 3minutes by recorded video**

PA-1. **“Nonlinear elasticity of perovskite high-Tc superconductors”**

K. P. Jayachandran^{1,2*} and C.S. Menon³

¹ *School of Nanoscience and Nanotechnology, Mahatma Gandhi University, Kottayam-
686560, Kerala, India,*

¹ *IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais, 1049-001
Lisboa, Portugal*

³ *School of Pure and Applied Physics, Mahatma Gandhi University, Kottayam-686560, Kerala,
India*

PA-2. **“Critical Temperature of Superconductor/Ferromagnet Nanostructures Exhibiting Intrinsic Spin-Orbit Coupling”**

Asif Majeed^{1*}, Junaid Ul Ahsan¹, Harkirat Singh¹

¹Department of Physics, National Institute of Technology, Srinagar J&K, 190006

PA-3. **“Vortices in rotating Bose gas interacting via finite range Gaussian potential in a quasi-two-dimensional harmonic trap”**

Md Hamid*, MAH Ahsan**

Department of Physics, Jamia Millia Islamia, New Delhi

PA-4. **“Applying an Artificial Neural Network (ANN) to calculate the copper-oxide superconductor critical temperature”**

Zakiya Al-Ruqaishi* and Raymond Ooi

Physics department, University of Malaya

PA-5. **“Superconducting Magnetic Energy Storage (SMES) Supercapacitor application using Magnetic Graphene Oxide (MGO)”**

R. Aiswarya,¹ T.Kalaivani ^{2*}

^{1,2} *Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Potheri, Kattankulathur 603203, Chengalpattu District, Tamilnadu, India.*

PA-6. **“Investigation on electronic properties of WS₂ monolayer and Ni-doped WS₂ with different concentrations – A first principle Study.”**

C. Poornimadevi*, C. Preferencial kala¹, D. John Thiruvadigal¹

¹*Centre for Materials Science and Nanodevices, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India*

PA-7. **“Tuning the Band Gap of Graphene Nanosheet with Si and Ge Dopant: First Principal Approach”**

G. Evangeline Ashna*, C. Preferencial Kala and D. John Thiruvadigal

¹*Centre for Materials Science and Nanodevices, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India*

PA-8. **“Anisotropic superconductivity in Li intercalated 2H-TaS₂”**

Tarushi Agarwal*, R. P. Singh

Indian Institute of Science Education & Research, Bhopal, India

PA-9. **“Hydrogen storage on in-plane and vertical heterostructure of boron nitride and graphene: A density functional theory study”**

B. Chettri^{1,2*}, P. K. Patra¹, D. P. Rai²

¹North-Eastern Hill University, Shillong, Meghalaya

²Pachhunga University College, Mizoram University, Aizawl, Mizoram

PA-10. **“Anomalous metallic oxygen band in the potential superconductor $KCa_2Fe_4As_4O_{22}$: A DFT study”**

N.S. Pavlov^{1,2*}, K.S. Pervakov², I.A. Nekrasov^{1,2}

¹ Institute for Electrophysics, Russian Academy of Sciences, Ekaterinburg, Russia

² P. N. Lebedev Physical Institute, Russian Academy of Sciences, Moscow, Russia

PA-11. **“Strain Tunable Electronic and Magnetic Properties of 2D ReI₃/FeI₃Van der Waals Heterostructures”**

John Donald Raj J*, Ardhendu Dey, Arijit Sen

SRM Institute of Science and Technology, Department Of Physics and Nanotechnology,
Kattankulathur, 603203,

PA-12. **“NOVEL GREEN SYNTHESIS AND ANTIMICROBIAL ACTIVITY, SOLAR PANEL APPLICATIONS OF CHITOSAN COBALT OXIDE NANOPARTICLES CONTAINING OSMIUM BASILICUM LEAVES EXTRACT”**

L.REVATHY, A.SRIVIDHYA¹, D. SHAKILA², K. GEETHA³ AND A. DINESH KARTHIK^{1*}

^{1*} Unit of Nanotechnology and PG and Research Department of Chemistry, Shanmuga Industries Arts and Science College, Tiruvannamalai, Tamil Nadu.

² PG and Research Department of Chemistry, Marudhar Kesari Jain College for Women, Vaniyambadi, Tirupathur - 632 002, Tamil Nadu, India.

³ PG and Research Department of Chemistry, Muthurangam Govt. Arts College (Autonomous), Vellore - 632 002, Tamil Nadu, India.

PA-13. **“Synthesis And Characterization of CuNiO@rGO for Supercapacitor Application”**

C.Udhayakeerthana,^{1*} T.Kalaivani,¹

¹Department of Physics, SRM Institute of Science and Technology, kattankulathur, India

PA-14. **“Application of Superconducting Material for Future Fast Charging Electric Vehicle Infrastructure”**

Femi Robert^{1*}

¹ Department of Electrical and Electronics Engineering,

SRM Institute of Science and Technology, Kattankullatur -603203.

PA-15. **“Structure and Superconducting Properties of $YBa_2Cu_3O_{7-\delta}$ Bulk Added with CNT**

Prepared by Thermal Treatment Method”

Fatma Ali Alfirgani Barood¹, Mohd Mustafa Awang Kechik^{1*}, Hussein Baqiah², Chen Soo Kien¹, Lim Kean Pah¹ and Abdul Halim Shaari¹

¹Laboratory of Superconductor & Thin Films, Department of Physics, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

²Shandong Key Laboratory of Biophysics, Institute of Biophysics, Dezhou University, No. 566 University Rd. West, Dezhou, Shandong, China

PA-16. **“Designing ferromagnetic polar half-metallic perovskite oxide superlattices through first-principles”**

Rajan Gowsalya^{*}, Monirul Shaikh^{*} and Saurabh Ghosh^{*}

^{*}Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur - 603 203, Tamil Nadu, India

PA-17. **“Study on sheet resistivity analysis of YBa₂Cu₃O_{7-δ} added Ca compounds via waste eggshell extraction”**

Yap Siew Hong^{1*}, Mohd Mustafa Awang Kechik¹, Hussien Baqiah², Chen Soo Kien¹, Lim Kean Pah¹, Abdul Halim Shaari¹, Mohd Hafiz Mohd Zaid¹, Yazid Yaacob¹, Mohd Khalis Abdul Karim¹, Loh Zhi Wei¹ and Aliah Nursyahirah Kamarudin¹

¹Superconductor & Thin Films Laboratory, Department of Physics, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia.

²Shandong Key Laboratory of Biophysics, Institute of Biophysics, Dezhou University, No. 566 University Rd. West, Dezhou, Shandong, China.

PA-18. **“VOCs adsorption on Sc₂CO₂ MXene as a promising sensing material for physiological disorder and food freshness monitoring”**

Rence P Reji^{1*}, C B Sarath Kumar¹, Yuvaraj Sivalingam², Velappa Jayaraman Surya^{1,3}

¹Novel, Advanced, and Applied Materials (NAAM) laboratory, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India

²Laboratory of Sensors, Energy, and Electronic devices (Lab SEED), Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India

³New Industry Creation Hatchery Center, Tohoku University, Aoba-Ku, Miyagi, Sendai, Japan

PA-19. **“Superior interaction of boron nitride quantum dots with ionic liquids using density functional theory”**

C B Sarath Kumar^{1*}, Yuvaraj Sivalingam², and Velappa Jayaraman Surya^{1,3}

¹Novel, Advanced, and Applied Materials (NAAM) Laboratory, Department of Physics and

Nanotechnology, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India.

²*Laboratory of Sensors, Energy and Electronic devices (Lab SEED), Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur 603203, Tamil Nadu, India.*

³*New Industry Creation Hatchery Center, Tohoku University, Aoba-Ku, Miyagi, Sendai 980-8579, Japan*

PA-20. **“Tonic liquids-based electrolytes for high performance Energy Storage devices”**

Sreeram Jayan^{1*}, Yuvaraj Sivalingam², and Velappa Jayaraman Surya^{1,3}

¹*Novel, Advanced, and Applied Materials (NAAM) laboratory, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India*

²*Laboratory of Sensors, Energy, and Electronic devices (Lab SEED), Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India*

³*New Industry Creation Hatchery Center, Tohoku University, Aoba-Ku, Miyagi, Sendai, Japan*

PA-21. **“Peptide-based biosensor for the detection of Biomolecules: a first-principle study”**

Roshal P S^{1*}, Yuvaraj Sivalingam², and Velappa Jayaraman Surya^{1,3}

¹*Novel, Advanced, and Applied Materials (NAAM) laboratory, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India*

²*Laboratory of Sensors, Energy, and Electronic devices (Lab SEED), Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India*

³*New Industry Creation Hatchery Center, Tohoku University, Aoba-Ku, Miyagi, Sendai, Japan*

PA-22. **“INVESTIGATION OF POLY-LACTICACID AND POLY-HYDROXYALKANOATES FOR BIO-MEDICAL APPLICATION”**

Mayank^{1*}, Velappa Jayaraman Surya² and Yuvaraj Sivalingam³

¹*Novel, Advanced, and Applied Materials (NAAM) laboratory, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India*

²*Laboratory of Sensors, Energy, and Electronic devices (Lab SEED), Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India*

PA-23. **“Electronic Properties of Atomically thin Films of metals in the periodic table”**

Akanksha Ashok Sangolkar^{*} and Ravinder Pawar

Department of Chemistry, National Institute of Technology Warangal (NITW), Warangal, Telangana-506004, India

PA-24. [“Temperature Dependent Ultra-Fast Polarization switching in hybrid improper ferroelectric double perovskite oxides”](#)

Palanichamy Gayathri^{a*}, Swaminathan M.J^a, Ayana Ghosh^{b,c} & Saurabh Ghosh^a,

^a*Dept. of Physics and Nanotechnology, SRM Institute of Science and Technology,
Kattankulathur-603 203, Tamil Nadu, India*

^b*Center for Nanophase Materials Sciences Oak Ridge National Laboratory, Oak Ridge, TN 3783,
United States*

^c*Computational Sciences and Engineering Division, Oak Ridge National Laboratory, Oak Ridge,
TN 3783, United States*

(Ending time: 19:30 Japan, 18:30 China, 16:00 India, 11:30 London, 6:30 Washington)

23rd September, 2022(Friday)

(Opening time: 10:00 Japan, 9:00 China, 6:30 India, 2:00 London, 21:00[21st night] Washington)

Session V: 10:00-12:30 Vortex, Topological Superconductors

Chair: Worawat Meevasana

- 10:00-11:00 (Keynote-1) **“Superconductivity in a quintuple-layer square-planar nickelate”**
Julia A. Mundy^{1*}, Grace A. Pan¹, Dan Ferenc Segedin¹, Harrison LaBollita²,
Qi Song², Berit H. Goodge^{3,4}, Lena F. Kourkoutis^{3,4}, Charles M. Brooks¹, Antia
S. Botana²
¹ *Department of Physics, Harvard University, Cambridge, MA*
² *Department of Physics, Arizona State University, Tempe, AZ*
³ *School of Applied and Engineering Physics, Cornell University, Ithaca, NY*
⁴ *Kavli Institute at Cornell for Nanoscale Science, Cornell University, Ithaca,
NY*
- 11:00-11:30 (Invited-14) **“Novel Superconductivity with 6-Electron Entanglement”**
Xiao Hu
Interna International Center for Materials Nanoarchitectonics (WPI-MANA)
National Institute for Materials Science (NIMS); Tsukuba 305-0044, Japan
- 11:30-12:00 (Invited-15) **“Surface atomic-layer superconductors: Josephson vortex and dynamic spin-momentum locking”**
Takashi Uchihashi
National Institute for Materials Science, Tsukuba, Ibaraki, Japan
- 12:00-12:30 (Invited-16) **“Spin Texture of Majorana Bound State in Topological Superconductors”**
Takuto Kawakami^{1*}, Xiao Hu²
¹ *Department of Physics, Osaka University,*
² *International Center for Materials Nanoarchitectonics (WPI-MANA),
National Institute for Materials Science (NIMS)*

Session VI: 12:30-13:30 New Structures

Chair: IoChun HOI

- 12:30-13:00 (Invited-17) **“Study of Second Generation HTS Tape Joint by Low Temperature**

Sintering of Nano-Silver Paste

In-Gann Chen^{*}, Chi-Lei Chang, and Chia-Ming Yang

Department of Materials Science and Engineering, National Cheng-Kung University, Tainan 701, Taiwan;

13:00-13:30 (Invited-18)

“Superconductivity in Non-Centrosymmetric Superconductor, Re_6Zr ”

Sangita Bose

School of Physical Sciences, UM-DAE Center for Excellence in Basic Sciences, University of Mumbai

13:30-14:00 Break

Session VII: 14:00-16:00 Applications-1

Chair: Charles Cerny

14:00-15:00 (Keynote-2)

“Progress of the Superconducting Maglev Chuo Shinkansen”

Junichi Kitano

Central Japan Railway Company

15:00-15:30 (Invited-19)

“Deterministic loading of microwaves onto an artificial atom using a time reversed waveform”

IoChun HOI

Department of Physics, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong SAR, China

15:30-16:00 (Invited-20)

“Developing a scalable superconducting quantum computer and its control system”

Yung Szen Yap^{1,2*}, Rainer Dumke^{2,3}

¹ *Faculty of Science and Centre for Sustainable Nanomaterials (CSNano), Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia*

² *Centre for Quantum Technologies, National University of Singapore,*

3 Science Drive 2, Singapore 117543, Singapore

³ *Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, 21 Nanyang Link, Singapore 637371, Singapore*

16:00-16:10 Break

Session VIII: 16:10-18:40 Applications-2

Chair: Hyoung Joon Choi

16:10-17:10 (Keynote-3) **“Applications of Superconducting Materials in Disruptive Technologies”**

Charles Cerny

USAF Research Laboratory, USA

17:10-17:40 (Invited-21) **“Low-dimensional superconductivity driven by valance fluctuation in layered materials”**

Mohammad Saeed Bahramy

Department of Physics and Astronomy, The University of Manchester

17:40-18:10 (Invited-22) **“Interaction at the surface of SrTiO₃ and related superconducting phenomena”**

Worawat Meevasana

School of Physics, Suranaree University of Technology, Thailand

18:10-18:40 (Invited-23) **“Design, and build, of flux-pumped REBCO superconducting rotating machines”**

Rodney A Badcock^{1*}, James G Storey¹, Zhenan Jiang¹, Kent A Hamilton¹, Grant Lumsden¹, Swarn S Kalsi², Hubertus W. Weijers¹, Sangkwon Jeong³, Michael Gschwendtner⁴, Sarat Singamneni⁴, Alan Caughley⁵

¹*Paihau - Robinson Research Institute, Victoria University of Wellington, 76 Sydney Street, Lower Hutt, 5012, New Zealand*

²*Kalsi Green Power System LLC, Princeton, NJ, USA*

³*Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon, 34141, Republic of Korea*

⁴*Mechanical Engineering, Auckland University of Technology, 34 St Paul Street, Auckland, 1010, New Zealand*

⁵*Callaghan Innovation, 5 Sheffield Crescent, Christchurch, 8053, New Zealand*

18:40-19:00

Closing Remarks: Yoshiyuki Kawazoe

(Ending time: 19:00 Japan, 18:00 China, 15:30 India, 11:00 London, Washington: 6:00)