



Newsletter | April 2024

Editor's Note

Welcome to the April 2024 issue of the Nanotechnology Council newsletter. This issue brings you the latest updates and activities in the IEEE-NTC community. We hope you enjoy it and do let us know if there is any topic you'd like to see covered in the future. All future content submissions to the newsletter should be sent to the editors: Yijun Cui and Ke Chen.



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Ke Chen Nanjing University of Aeronautics and Astronautics Nanjing, China

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BREAKING NEWS

OJ-NANO CFP: Special Section – IEEE-NSENS 2024: Nano Materials and Devices for Sensors, AI, and Robotics

Scope and Purpose

IEEE 0J-NANO will devote a special section on "IEEE-NSENS 2024: Nano Materials and Devices for Sensors, AI, and Robotics" to a collection of papers highlighting research and technology development in the field of nanotechnology, particular of materials and devices for the applications in sensors, AI and robotics. IEEE Nanotechnology Council sponsors the 3rd IEEE International Conference on Micro/Nano Sensors for AI, Healthcare, and Robotics (IEEE-NSENS 2024) held on 2 – 3 March 2024 to foster interaction between engineers, scientists and industry in these emerging areas.

Topics of Interest

Areas of interest include but are not limited to:

- Micro/Nano Electro soft electronics
- Micro/Nano Electro artificial intelligence Micro/Nano Electro bioelectronics

- Micro/Nano Electro bioelectronics
 Micro/Nano Electro power electronics
 Micro/Nano Electro nanobiotechnology
 Micro/Nano Electro healthcare electronics
- Micro/Nano Electro medical diagnostics
- Micro/Nano Electro human-robot interaction
- Micro/Nano Electro machine learning
- Micro/Nano Electro deep learning
 Micro/Nano Electro humanoid robots
 Micro/Nano Electro flexible sensors

Deadlines

Manuscript Submission: 30 April 2024 Anticipated Publication: 31 November 2024

Guest Editors

- Yunlong Zi, Ph.D.

 - Associate Professor, Sustainable Energy and Mechanical Engineering
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- Kewang Nan, Ph.D.
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For more information, please visit the website.

OJ-NANO Call for Papers: Special Section – Future Nanocomputing: Trends and Challenges

Scope and Purpose

The concept of nanocomputing refers to the ability of computers to represent and manipulate data in the nanometer scale. In practice, circuits and computer systems are constructed using transistors with channels significantly shorter than 100 nanometers. Consequently, the current objective is to develop computers that utilize devices no larger than 10 nanometers. To achieve this, nanocomputing must undertake a comprehensive examination of nanotechnology in the field of computing. This aspect comprises interdisciplinary investigations that traverse various fields through the utilization of nanoscale technologies and the exploration of innovative processing paradigms. At the lowest device level, it encompasses not only CMOS but also numerous emerging technologies (including spintronics, molecular, superconducting, and DNA). However, it also incorporates circuit design considerations. It is unsurprising that this research necessitates a forum (and related community) that transcends disciplines to deliberate on innovative post-CMOS and advanced technological avenues for nanocomputing. To address the primary challenges encountered by integrated electronics in the twenty-first century, inventive future resolutions are necessary.

Topics of Interest

Topics of interest to this special issue include, but are not limited to, contributions concerning almost every technology targeting for future nanocomputing. More specifically, these may include, but not limited to the following:

- Novel nanodevices for computing applications.
- Innovative manufacturing/integration ideas including chiplets with a focus on computation as application.
- Nanoelectronic circuits, nanofabrics, and nanoarchitectures/systems.
- Future and emergent nanotechnology-based paradigms for computing. Nanotechnology with unpredictable devices.
- Emerging memory nano-devices and in-memory nanotechnology-based designs.
- Security with nanofabrics.
- Reliability aware nanotechnology for reliable operation.
- 2D/3D, hybrid, defect/fault tolerant schemes, integration, and manufacturing.
- Nanodevice and nanocircuit models, methodologies, and computer aided design tools.

Important Dates

Manuscript submissions due: 01 May 2024 First round of reviews completed: 01 July 2024 Revised manuscripts due: 15 Aug 2024 Second round of reviews completed: 15 Sept 2024 Final manuscripts due: 01 Oct 2024 Accepted manuscripts final submission: 31 Oct 2024 Target publication date: 30 Nov 2024

Guest Editors

- Prof Giovanni Finnochio, Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina, 98166, Messina, Italy Email: finocchio@unime.it
- Fabrizio Lombardi, College of Engineering, Northeastern University, Boston, MA, USA, Email: lombardi@ece.neu.edu
- Georgios Ch. Sirakoulis, Department of Electrical and Computer Engineering, Democritus University of Thrace, 67100 Xanthi, Greece, Email: gsirak@ee.duth.gr

For more information, please visit the website.

International Workshop on Ising Machines - 2024

The International Workshop on Ising Machines (IISM) will be held in Messina, Italy from **16 to 18 April 2024**. This workshop is "Technically Co-Sponsored (TCS) by IEEE Nanotechnology Council (IEEE NTC)" and co-organized by TC-16 Quantum, Neuromorphic, and Unconventional Computing Technical Committee of NTC and Petaspin Association. Born out of the growing interest in the application of Ising machines for combinatorial optimization, the IISM aims to provide a dedicated platform for discussion and collaboration in this burgeoning field.

The conference will be co-chaired by renowned experts in the field, Giovanni Finocchio of the University of Messina and Johan Åkerman of the University of Gothenburg. IISM is planned to become a major event in the dissemination activities related to Ising machine.

IISM 2024 will cover a wide range of topics, including theoretical perspectives on Ising machines, digital applications, simulations of innovative computing paradigms, and hardware advances related to analog and hybrid Ising machines. The program of the IISM 2024 will feature an impressive line-up of invited speakers. For more information, please visit the website.

Topics

The International Workshop on Ising Machines is conceived as the ideal place to share new ideas and perspectives on both theoretical and experimental applications of Ising machines.

The main topics covered by the conference will include:

- Ising encoding techniques and algorithms
- Combinatorial optimization with Ising machines
- Advanced energy minimizations strategies
- Theory of Ising machines
- Probabilistic computing
- Coherent Ising machine
- Oscillatory Ising machines
- High-order Ising machines
- Simulated bifurcation
- Other promising unconventional computing paradigms
- Quantum annealers
- Spintronic Ising machines

MARSS2024 Registration Open

Short paper submission (1-3 pages) extended until 30 April, at the latest

The 7th Int. Conference on Manipulation, Automation and Robotics at Small Scales (MARSS) will be held on 01-05 July 2024, in Delft, Netherlands. General Chairs: Massimo Mastrangeli (NL) and Pierre Lambert (BE). MARSS is the flagship forum for cross-disciplinary R&D communities related to manipulation, automation, measurement and characterization at micro/nano scales as well as all kinds of small size robots (nm - cm) and their applications. The conference is technically supported by IEEE-NTC and IEEE-RAS.

MARSS2024 will feature 14 plenary talks (by invitation only) and up to 36 technical sessions (oral presentations). We encourage you to attend and contribute to the conference.



MINATO Summer School

1st International Summer School on Micro and Nano-fabrication Tools for Innovating Applied Electronics and Fundamental Research (MINATO 2024) Extended Application Deadline: 29 April 2024

 $\underline{\text{Mi}}$ cro and $\underline{\text{Na}}$ no-fabrication $\underline{\text{to}}$ ols for innovating applied electronics and fundamental research

In the south of France, you will study within a high-ranking French engineering institute, INSA Toulouse, and have the chance to fabricate your own device in clean room and research facilities.

MINATO summer school is a summer school on Micro and Nano-fabrication tools for innovating applied electronics and fundamental research. The objective for each student will be to acquire new scientific skills and knowledge, both theoretical and practical, in the field of nanoscience and nanotechnology.

The total number of students is limited to 24.

The Summer School aims at introducing micro&nano fabrication techniques, with a handson interdisciplinary approach that alternates basic lectures and experimental activities. The core of the summer school will be mainly on the uses of these technologies, starting from virgin Silicon wafer to building up and exploiting a fully functional device. Over two or four weeks, after a series of introduction lectures, each student will take in charge the micro&nano fabrication and characterization of its own device using clean room facilities (MOS electronics, solar cell, micro-super condensator, gas sensor,2D material-based devices, ...).

Design your own summer school program with one or two lab work thematic sessions among:

- Microelectronics- MOS (metal oxide semiconductor) technology (elementary components, diode, transistor, integrated circuits)
- Energy: integrated energy harvesting (solar cell) and storage (microsupercondensator) technologies
- Nano-chemistry: chemical sensors based on metal oxide semi-conductors nanoobjects
- Nano-Physics: remarkable properties of devices integrating 2D materials (graphene, ...)
- **Quantum technologies**: ultrasensitive sensors and quantum cryptography (only for 4 weeks program)

MINATO, fully taught in English, is organized by INSA Toulouse engineering school and NanoX graduate school of research.

Who can apply: All science and engineering students with undergraduate or graduate level, including PhD students (diploma above a bachelor of science in mathematics, physics, chemistry, electronics).

For details visit this website.

TECHNICAL ACTIVITIES

IEEE NTC Shanghai Chapter 2023-2024 Nanotechnology Distinguished Seminars

From December 2023 to January 2024, Nanotechnology Distinguished Seminars (NDS) were held three times in the IEEE Nanotechnology Council (NTC) Shanghai Chapter, China. NDS Series are proposed and chaired by Prof. Weida Hu from the Shanghai Institute of Technical Physics (SITP) as the Chair of IEEE NTC Shanghai Chapter with Prof. Ivan Iorsh from ITMO University, Prof. Mario Lanza from the King Abdullah University of Science and Technology and Prof. Wenwu Pan from the University of Western Australia. There were totally 48 participants coming from China, Russia, and Saudi Arabia. NDS Series invited experts with various backgrounds to bring cutting-edge nanotechnology knowledge to our students, break down information barriers, and ultimately achieve collaborative development within the organization. A series of insightful presentations showcased groundbreaking developments in nanotechnology. Highlights of the talks included:

- Combining two-dimensional semiconductors with metasurfaces
- Hybrid 2D/CMOS microchips
- Dislocation Filtering Technology for defect reduction on heteroepitaxially-grown semiconductors

Prof. Ivan Iorsh from ITMO University briefly reviewed their recent results on the lightmatter coupling in 2D semiconductors integrated with photonic nanostructures. He also discussed how the realization of strong light-matter coupling might facilitate the suppression of the inhomogeneous broadening of excitons and induce a strong nonlinear optical response. Furthermore, He showed how the excitonic properties can be controlled via strong light-matter coupling and finally discussed how one can exploit strong magnetic proximity effect in order to enable magnetooptics with 2D materials. Prof. Mario Lanza from the King Abdullah University of Science and Technology discussed how to integrate 2D materials in micro/nano-electronic devices, circuits, and microchips, giving a general overview of the global progress achieved in the field and presenting our last developments in hybrid 2D/CMOS applications. He put special emphasis on devices and circuits for memristive technologies, including data storage, computation, encryption, and communication. He also discussed the main technological challenges to face in the next years and provided some recommendations on how to solve them. Prof. Wenwu Pan from the University of Western Australia showed the use of strained CdZnTe/CdTe superlattice layers as dislocation filter layers for the heteroepitaxy of II-VI CdTe buffer layers on lattice-mismatched III-V GaAs substrates. Their experimental results reviewed here suggest that the dislocation filtering technology is a promising approach for achieving high-quality heteroepitaxy of semiconductors on large-area lattice-mismatched substrates, which is crucial for the fabrication of high-performance optoelectronic devices, especially monolithically integrated devices

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The IEEE NTC Shanghai Chapter Nanotechnology Distinguished Seminar Series was a great success, making all participants rejoice in their contribution to the synergistic development within IEEE NTC Shanghai Chapter and future endeavors in the field of nanotechnology.



Prof. Ivan Iorsh from ITMO University



Prof. Mario Lanza from the King Abdullah University of Science and Technology



Prof. Wenwu Pan from the University of Western Australia

YOUNG PROFESSIONALS

New regional representatives for NTC Young Professionals:



Huamin Li, Region 1 YP Representative

Huamin Li received his BS degree from the College of Physics and Electronics, Shandong Normal University, Jinan, China, in 2007, his MS degree from the College of Engineering, Sungkyunkwan University (SKKU), Suwon, Korea, in 2010, and his PhD degree in the Department of Nano Science and Technology, SKKU, Suwon, Korea, in 2013. His PhD research focused on 2D electronics and optoelectronics. Subsequently, he worked as a postdoctoral research associate in the Department of Electrical Engineering, University of Notre Dame.

His postdoctoral work included the development of low-voltage and steep subthreshold swing (SS) components for beyond-CMOS electronic systems using low-dimensional materials. To date, his research results have been included in one book chapter (2013), published in Nature Communications (2015), Scientific Reports (2014), IEEE Transaction on Electron Devices (2009-2012) etc., presented in IEEE International Electron Devices Meeting (IEDM, 2009, 2011-2013), and filed five US and Korean patents with the collaboration of Samsung Electronics Co., Ltd. In 2012, he received Chinese Government Award for outstanding self-financed students abroad by China Scholarship Council.



Marta Wala, Region 8 YP Representative

Marta Wala-Kapica earned her Bachelor's degree in 2017 and Master's degree in 2019, specializing in Inorganic Technology, from the Faculty of Chemistry, Silesian University of Technology, Gliwice, Poland. In 2023, she successfully defended her Ph.D. thesis in Chemical Engineering at the same institution. Her research primarily revolves around the synthesis of electrocatalytic materials through advanced electrochemical surface modification techniques, such as Electrosynthesis, Electrodeposition, and Plasma Electrolytic Oxidation.

She is particularly passionate about leveraging these methodologies for various biomedical applications and addressing environmental challenges.

NTC Young Professionals (YPs) strikes again: Read here how NTC YPs supported the great initiative of the IEEE Summer School on Nanotechnology 2022.

This initiative's was inspired by YPs for YPs, as well as students and researchers on nanomaterials. This work highlights the knowledge dissemination and the training programs conducted during 16th – 19th November 2022 as part of Training on Fabrication and Characterization of Nanomaterials at VNR Vignana Jyothi Institute of Engineering.

Congratulations to Region 10 NTC YPs representative Dr. Santhosh Sivasubramani for being awarded with the IEEE Pre-University STEM Portal Grant proposal for the initiative «TryNano – The NanoQuest: Empowering Girls in STEM through Nanotechnology Exploration» (learn more)

NTC YPs and the VP for Educational Activities are supporting the first time ever the first edition of the NANO STUDENT DESIGN COMPETITION (NANO-SDC) to be held during IEEE NANO 2024 (learn more). Did you submit a paper to IEEE NANO 2024? There is still time to apply and participate in the Student Design Competition! Please complete this form.

NTC Young Professionals Update

Five Regional NTC YP LinkedIn pages have been established and are timely updated. The regional coordinators established cooperation with the regional NTC conference organizers in order to support and ensure presence of young professionals.

NTC YP LinkedIn:

- Region 7 (Canada)
- Region 9 (Latin America)
- NTC YP India
- Region 8 (Africa, Europe, Middle East)
- Region 10 (Asia and Pacific)



NANO 2024 – Call for Registration



The 24th IEEE International Conference on Nanotechnology (IEEE NANO 2024) will be held from 08-11 July 2024, in Gijón, Spain. https://2024.ieeenano.org/ Download CFP (PDF)

Since its founding in 2001, IEEE NANO has been the flagship conference of the IEEE Nanotechnology Council (NTC). It promotes advanced research in nanoscience and nanotechnology.

IEEE NANO 2024 invites contributions from both academic and industry-based researchers in the field of nanotechnology.

NEMS 2024 – Call for Registration



The 19th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE-NEMS2024) will be held in Kyoto University of Advanced Science (KUAS), between 02-05 May 2024. https://www.ieee-nems2024.org Download CFP (PDF)

IEEE-NEMS is a premier conference series sponsored by the IEEE Nanotechnology Council focusing on the promotion of advanced research areas related to MEMS, nanotechnology, and molecular technology. Prior conferences were held in Jeju (Korea, 2023), Bangkok (Thailand, 2019), Singapore (2018), Los Angeles (USA, 2017), Matsushima and Sendai (Japan, 2016), Xi'an (China, 2015), Hawaii (USA, 2014), Suzhou (China, 2013), Kyoto (Japan, 2012), Kaohsiung (Taiwan, 2011), Xiamen (China, 2010), Shenzhen (China, 2009), Hainan Island (China, 2008), Bangkok (Thailand, 2007), Zhuhai (China, 2006).

IEEE NEMS 2024 invites all interested MEMS, nanotechnology, and molecular technology fields professionals and academics to submit oral and poster. We welcome you to contribute to the most up-to-date research and latest developments from around the world. Abstracts will be reviewed by the Technical Committee and, if accepted, the author will be asked to submit the full paper (optional) which will be assigned to the appropriate session based on the author's application and program requirements.

The registration is open now.

NMDC 2024 – Call for Papers



19h IEEE Nanotechnology Materials and Devices Conference (IEEE NMDC 2024) 22-25 October 2024, Salt Lake City, Utah, United States https://ieeenmdc.org/nmdc-2024 Conference venue: Radisson Salt Lake City Downtown

IEEE NMDC is a flagship conference series of the IEEE Nanotechnology Council (NTC), focusing on research advances in the fields of nanoscience and nanotechnology.

Key Dates:

Abstract Submission Date: **15 May 2024** Full Paper Submission: 15 July 2024 Notification of Acceptance: 1 September 2024 Final Paper Submission: 1 October 2024 Accepted and presented full papers (4 to 6 pages) for IEEE NMDC 2024 will be included in IEEE *Xplore* as well as other Abstracting & Indexing (A&I) databases.

We are proud to announce that the 19h IEEE Nanotechnology Materials and Devices Conference (NMDC) will be held in lovely Salt Lake City, Utah, USA 22 to 25 October 2024. IEEE NMDC 2024 will be the perfect stage to promote research from all across the world.

3M-NANO 2024 Call for Papers



www.3M-NANO.org Download CFP (PDF)

3M-NANO is the annual International Conference on Manipulation, Manufacturing and Measurement on the Nanoscale; it will be held on 29 July – 2 August 2024 in Zhongshan, China. The ultimate ambition of this conference series is to bridge the gap between nanosciences and engineering sciences, aiming at technology opportunities and new markets. The advanced technologies for manipulation, manufacturing and measurement at nanoscale promise novel revolutionary products and methods in numerous areas of application. Scientists working in research fields related to 3M-NANO topics are invited to submit papers.

All accepted full papers (presented at the conference and following IEEE format) will be submitted in IEEE *Xplore* database and Ei Compendex. Selected papers will be recommended for publication in the *IEEE Trans. on Automation Science & Engineering*, *Int. J of Nanomanufacturing*, *IFAC Mechatronics*, *Int. J of Optomechatronics*, *J of Micro-Bio Robotics*, *Journal of Bionic Engineering*, *Light (Science & Applications)*, *Optics and Precision Engineering*, *International Journal of Extreme Manufacturing*, *Material Today Bio*, and other SCI/EI journals.

Important Dates

Full paper submission: 1 May 2024 Proposals for special session (5-6 papers): 1 May 2024

MARSS 2024: Call for Papers

MARSS

International Conference on Manipulation, Automation and Robotics at Small Scales



Delft, Netherlands July 01-05, 2024

https://marss-conference.org Download Call for Papers (PDF)

MARSS, the annual International Conference on Manipulation, Automation and Robotics at Small Scales, is a <u>non-profit</u> conference run by the microrobotic community and technically supported by IEEE-RAS and IEEE-NTC. MARSS2024 will be held **in-person** on **01-05 July 2024**, **in Delft, Netherlands**. The conference is the flagship forum to discuss cross-disciplinary activities on 1) manipulation, automation, measurement, and characterization at micro/nano scales, and 2) all kinds of small-scale robots (nm - cm) and their applications.

Program: MARSS2024 offers 13-14 plenary talks and up to 36 technical sessions. The high-profile plenary talks (40 min) will be given by distinguished experts. All accepted papers (full and short) will be presented in the technical sessions (20 min, oral presentation) Accepted full papers will be submitted for inclusion into IEEE *Xplore* subject to meeting IEEE *Xplore*'s scope and quality requirements.

Awards: All presented full papers will contest for various. The Best Paper Awards Awards include a certificate and a cash prize. Additionally, MARSS2024 will present Big-on-Small Award, along with a commemorative plaque and a cash prize. This Award is intended to promote upcoming talents in MARSS-related fields of research with excellent performance and international visibility.

Venue: MARSS2024 will be held on the main campus of Delft University of Technology (TU Delft). Delft enjoys a worldwide reputation due to its connection with Johannes Vermeer, Delft Blue earthenware and the Royal House. You will relive its glorious past as you wander along canals, churches and courtyards. This university town with medieval architecture also features canal tours, museums, and markets.

Important Dates:

Full paper submission (5-6 pages): 31 March 2024 **(no extension possible!)** Short paper submission (1-3 pages): Extended until 30 April, at the latest Notification of paper status:

Full paper: within 2 weeks after the submission

• Short paper: 2-3 days after the submission Submission of camera-ready full papers: 30 April 2024 Registration for speakers of full papers: 30 April 2024 Early Bird registration (discounted): 30 April 2024 Special session proposals:

31 March 2024 (preliminary proposal, OPTIONAL)

• 30 April 2024 (final list of Session speakers)

IEEE NAP-2024: Call for Papers



https://ieeenap.org/ Download CFP

The 2024 IEEE 14th International Conference "Nanomaterials: Applications & Properties" is devoted to the most interesting aspects of modern Materials Science with a prime focus on nanoscale materials. The IEEE NAP-2024 Conference is organized through a partnership between the IEEE Nanotechnology Council and the University of Latvia, and technical support from the Latvian Academy of Sciences, the Institute of Electronics and Computer Sciences and Sumy State University, with endorsements and support from the IEEE Magnetics Society.

Important Dates:

Abstract submission deadline: 15 Apr 2024 Abstract acceptance notifications: 01 May 2024 4-Pages Paper submission deadline: 01 Jun 2024 Manuscript acceptance/rejection notifications: 31 Jul 2024 Early registration fees deadline: 15 Jun 2024



IEEE Transactions on Nanotechnology

View the full current issue of IEEE T-NANO.

For additional information, visit the IEEE *Xplore* website.

To find how to submit to T-NANO, click here.





IEEE Open Journal of Nanotechnology

View the full current issue of IEEE OJ-NANO. For additional information, visit the IEEE *Xplore* website. To find how to submit to OJ-NANO, click here.



IEEE Nanotechnology Magazine

View the full current issue of IEEE INM. For additional information, visit the IEEE *Xplore* website. For information on submitting to INM, click here.



IEEE Transactions on NanoBioscience

View the full current issue of IEEE T-NB.

For additional information, visit the IEEE *Xplore* website.

To find how to submit to T-NB, click here.



LIST OF NANOTECHNOLOGY COUNCIL OFFICERS (2024)

Position	Name	Position	Name
President	Jin-Woo Kim	Past-President	Fabrizio Lombardi
Vice President for	Kremena	Vice President-Elect for	John Yeow
Conferences	Makasheva	Conferences	
Vice President for	Luca	Vice President for	Malgorzata
Educational Activities	Pierantoni	Finances	Chrzanowska-Jeske
Vice President for	Georgios	Vice President for	Weiqiang Liu
Publications	Sirakoulis	Technical Activities	
Secretary	Edward G. Perkins		

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