

## Newsletter | June 2023

### Editor's Note

Welcome to the June 2023 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 new editors: Yijun Cui and Ke Chen.



**Yijun Cui**

Nanjing University of  
Aeronautics and  
Astronautics  
Nanjing, China



**Ke Chen**

Nanjing University of  
Aeronautics and  
Astronautics  
Nanjing, China

### Contents:

[BREAKING NEWS](#)

[COUNCIL ACTIVITIES](#)

[TECHNICAL ACTIVITIES](#)

[CHAPTER EVENTS](#)

[YOUNG PROFESSIONALS](#)

[CONFERENCES](#)

[PUBLICATIONS](#)

## BREAKING NEWS

### Submission Extended: IEEE NMDC 2023



**18th IEEE Nanotechnology Materials and Devices Conference (IEEE-NMDC 2023) 22-25 October 2023, Paestum, Italy.**

**Final abstract submission deadline: 22 June 2023**

Conference venue: [Ariston Congress Center Paestum, Salerno, Italy](#)

Website: <https://ieeenmdc.org/nmdc-2023>

IEEE-NMDC 2023 will be held in the pleasant environment of the ancient city of

**Paestum**, one of the most important archeological sites of south **Italy**, **UNESCO** heritage since 1997. The conference has received already more than 300 abstracts (included 9 plenaries, 30 keynotes and over 100 invited talks). IEEE NMDC is a flagship conference series of the IEEE Nanotechnology Council (NTC), focusing on research advances in the fields of nanoscience and nanotechnology.

#### Conference Scope:

The conference focuses on the latest scientific and technological advances related to:

- Nanorobotics & Nanomanufacturing
- Nano-biomedicine
- Nanofabrication
- Nano-optics, Nano-photonics & Nano-optoelectronics
- Spintronics
- Nanoelectronics: Emerging material and device challenges in futuristic systems
- Nanosensors & Nanoactuators
- Nanomaterials
- Nanometrology & Characterization
- Modeling & Simulation
- Nanopackaging
- Nanomagnetism
- Nanoenergy, Environment & Safety
- Nanoscale Communications and Nanonetworks
- Nano-acoustic Devices, Processes & Materials
- Quantum, Neuromorphic & Unconventional Computing
- Emerging Plasma Nanotechnologies
- MEMS/NEMS
- Nanodiamond and nanocarbon structures: materials and devices
- Education in nanotechnology
- Commercializing nanotechnology
- Fundamentals and applications of nanotubes, nanowires, quantum dots and other low dimensional materials
- DNA Nanotechnology
- Nano-fluidics and integrated bio-chips
- Nanotechnology Ethics

#### Key Dates:

Extended Abstract Submission Deadline: 22 June 2023

Full Paper Submission Deadline: 15 July 2023

Early Registration Deadline: 30 May 2023

Accepted full papers (4 to 6 pages) for IEEE-NMDC will be included into IEEE *Xplore* as well as other Abstracting & Indexing (A&I) databases.

The IEEE NMDC 2023 will be the perfect stage to promote research from across the world.

#### General Chair:

Antonio Di Bartolomeo, University of Salerno, Italy

#### Co-Chairs:

Filippo Giubileo, CNR-SPIN, Italy

Nadia Martucciello, CNR-SPIN, Italy

---

### CALL FOR PAPERS: *IEEE Journal on Exploratory Solid-State Computational Devices and Circuits*



#### Special Topic on Steep Slope Transistors for Energy-Efficient Computing & More

#### Guest Editor:

Alan Seabaugh, University of Notre Dame, [seabaugh.1@nd.edu](mailto:seabaugh.1@nd.edu)

#### Editor-in-Chief:

Azad Naeemi, Georgia Institute of Technology, [azad@gatech.edu](mailto:azad@gatech.edu)

#### Aims and Scope:

Tunnel field-effect transistors (FETs) and low-subthreshold-swing steep-slope (SS) transistors hold promise to outperform complementary metal-oxide semiconductor technology (CMOS) at low voltage and realize more energy-efficient logic for computation. The aim of this special topics issue is to highlight experimental

advances and ideas that make SS transistors attractive for integration with CMOS to realize better power-performance logic. Aspirational characteristics for n- and p-type steep transistors can be summarized as follows: drain currents exceeding 200  $\text{\AA}\mu\text{A}/\text{\AA}\mu\text{m}$  at a supply voltage below 0.4 V, with SS less than 60 mV/decade beginning near 1  $\text{\AA}\mu\text{A}/\text{\AA}\mu\text{m}$  and spanning more than 4 decades. Papers describing theory and modeling of transistors which can meet and surpass these goals are of interest, as are papers which assess the full design stack from devices to circuits and architecture to applications to identify system bottlenecks and inform technology development for computing, communications, or other applications. Materials approaches are not restricted to silicon CMOS and can be based on any semiconductor technology and incorporate multiferroic or other performance boosters. New approaches based on three-dimensional integration, heterogeneous integration, processing, or insights from manufacturing are also within the scope of this issue to advance understanding and progress in SS transistors.

#### **Topics of Interest:**

- TFET and other steep slope transistors with path to outperform CMOS at low voltage
- Experimental progress
- Theory and modeling
- Si, III-V, III-N, two-dimensional semiconductors and heterojunctions
- Multiferroic and other material/device design approaches
- 3-D integration, heterogeneous integration, processing, manufacturing Full-stack design to inform technology development

**Submit your article through the [JxCDC ScholarOne Site](#).**

#### **Important Dates:**

- **Open for Submission: 1 June 2023**
- **Submission Deadline: 1 Sept. 2023**
- **First Notification: 1 Oct. 2023**
- **Revision Submission: 15 Oct. 2023**
- **Final Decision: 15 Nov. 2023**
- **Online Special Topic Publication: 1 Dec. 2023**

#### **JxCDC is an Open Access only publication:**

Article Processing Charge (APC): US\$1,950

For papers submitted in 2023, the APC is US\$1,950 plus applicable local taxes.

The following discounts apply:

- IEEE Members receive a 5% discount.
- IEEE Society Members receive a 20% discount.

Discounts do not apply to undergraduate and graduate students. These discounts cannot be combined.

## COUNCIL ACTIVITIES

### **Nanotechnology for Computing**

Nanocomputing is a term that is coined for the representation and manipulation of data by computers in the nanometer dimension; nanocomputing must rely on an in-dept investigation of nanotechnology for computing (NfC). All difficulties pertaining to computing at the nanoscale are also present when addressing NfC. At all levels, these considerations have led to completely new technological computational paradigms such as approximate, stochastic, probabilistic, neuromorphic, molecular, spintronic and bio-inspired. Over the last few years, NfC has started to play a significant role in the IEEE NTC (Nanotechnology Council) and a new NTC technical committee has been formed. The NTC is best positioned to take advantage of the technical diversity of the Council and its member societies. We have identified two types of new activities:

2022 Activity, The Advanced Research Meeting (ARM): in this event held in 2022 (21-22 October) in Heraklion (Greece), we have convened 23 experts from 13 countries. The technical program consisted of five sessions; moreover five panels (as round tables among all participants) were also held; session topics were nanodevices, nano computational schemes and circuits, nanoscale computing systems, emerging application techniques at nanoscales and nano neural networks. As a follow up to ARM, the following activities are currently being pursued:

1. A compendium of the finding of the panels is being written for dissemination as an article in the *IEEE Nanotechnology Magazine*
2. A Special Issue of *IEEE Transactions on Nanotechnology* (TNANO) has been distributed to all invited participants with the objective to have few review

articles to cover past and current research as well as future directions of different topics of interest to NfC

**2023 Workshop on NfC (WNfC):** The two flagship technical meetings sponsored yearly by the NTC (NANO and NMDC) are organized by sessions (special and regular) with the involvement of the NTC Technical Committees. NANO and NMDC are single events with multiple parallel sessions. This arrangement has worked reasonably well over the years; however, technical conferences in the post-COVID era must capture not only width but also depth. This is extremely important in nanotechnology, because the audience may be drawn from the physical sciences as well as engineering; hence such in-person yearly meetings must have a flexible organization to allow concurrent events (in this case a workshop) to be held. The WNfC will have its proceedings included as part of the host conference, i.e., NANO 2023 (Korea).

Therefore, the focus of this workshop is to highlight the most recent research developments on innovative technologies for the design and implementation of novel nanocomputing paradigms. It will provide a unique forum for the discussion of the latest research achievements in the multifaceted scientific field of nanocomputing, that may contribute to the future development of circuits, sensors and processors with improved performance compared to the current state-of-the-art. With the aim to enrich the 23rd IEEE International Conference on Nanotechnology 2023 (IEEE NANO 2023) program with a comprehensive overview of the latest technological achievements in this multidisciplinary research field, the proposed nanocomputing-centered scientific forum will host contributions from outstanding international experimentalists, engineers and designers, providing a unique opportunity to exchange ideas, share knowledge, identify open issues, and propose future research directions across a wide number of different areas, from material engineering, to device physics, from circuit and systems, to circuit design and architecture.

## TECHNICAL ACTIVITIES

### 2023 IEEE NTC Modeling and Simulation Webinar Series

Organizer: Josef Weinbub, TC 10 Vice Chair, [weinbub@iue.tuwien.ac.at](mailto:weinbub@iue.tuwien.ac.at)  
Format: 1-hour Webex webinars

#### **Webinar 1**

**Day: 27 June 2023**

Time: 8:00 PDT, 17:00 CEST, 00:00 JST

Speaker: Philippe Blaise, Atomistic Senior Application Engineer, Silvaco, Inc.

Topic: Atomistic TCAD Simulations

#### **Abstract:**

For designing the most advanced technological nodes, quantum effects become hard to approximate. This leads to the failure of using conventional TCAD tools that are essentially based on empirical laws. Therefore, engineers need new simulation tools at the 5 nm node and below that combine a more fundamental formalism with affordable performances and ease of use. During this webinar, we will briefly describe what is behind the non-equilibrium Green's function (NEGF) formalism with simplified arguments. We will show how simulating nano-devices becomes easy, even without full academic knowledge of the NEGF theory. The quantum complexity is hidden inside the simulation tool "Atomistic" which benefits from years of development at the highest level. We will show two test cases: a silicon Nanowire Field-Effect Transistor (NWFET) and a 2D-TMD Tunneling FET (TFET) made of a layer of MoS<sub>2</sub>. Thanks to a combination of state-of-the-art band structure calculations with the NEGF, predictive, versatile, and fast simulations of these devices become accessible with an environment that provides a smooth transition for TCAD users.

#### **Biography:**

Dr. Philippe Blaise has been a senior application engineer in atomistic simulation at Silvaco's TCAD Division for four years. Prior to joining Silvaco, Dr. Blaise was a senior engineer specialized in atomistic simulation of new memory devices and transistors at CEA/LETI for 15 years. He is a former member of the IEEE IEDM Modelling and Simulation Committee. He is co-author of more than 60 papers in peer-review journals in the field and 30 contributions to conferences and workshops, plus five patents and one book chapter. Dr. Blaise holds a Master's degree in applied mathematics and a Ph.D. in solid states physics from the Université Grenoble Alpes, France.

[Webinar 1 Registration Link](#)

### Webinar 2

**Day: 12 October 2023**

Time: 16:00 PDT, 1:00 CEST, 08:00 JST

Speaker: Gerhard Klimeck, Professor and nanoHUB Director, Purdue University

Topic: nanoHUB for Research and Education in Nanoelectronics

### Webinar 3

**Day: 12 December 2023**

Time: 23:00 PDT, 8:00 CEST, 15:00 JST

Speaker: Tue Gunst, Senior R&D and Application Engineer, Synopsys

QuantumATK

Topic: QuantumATK Applied to Nanoelectronics

## Fifth Online Workshop of the NTC Technical Committee on Emerging Plasma Nanotechnologies

The Technical Committee on Emerging Plasma Nanotechnologies of the IEEE Nanotechnology Council will hold its **fifth online workshop** on **Monday, 26 June** at **8:00 pm CST** (UTC-5, Chicago-Austin time zone), or **Tuesday, 27 June 2023**, at **10:00 am JST** (UTC+9, Tokyo time zone), and **3:00 am CEST** (UTC+2, Berlin). It will be virtual with a very exciting program with speakers from academia and attendees from academia, national laboratories and industry. Attendance is free but registration is necessary.

This time we have a diverse set of topics spanning **energy storage/batteries and plasma nanostructure formation**. Our speaker lineup this time includes:

- **Plasma nanofabrication for energy storage applications**
  - Zheng Bo
  - Professor, IOP Fellow
  - Vice Director, State Key Laboratory of Clean Energy Utilization
  - College of Energy Engineering, Zhejiang University
- **Sodium-ion batteries for new generation electronic devices**
  - Yang Hui Ying
  - Professor at Singapore University of Technology and Design
- **Coupling simulations and experiments for plasma growth of large scale 1D or 2D nanostructures**
  - Oleg Baranov
  - Professor, Head of the Department of Theoretical Mechanics, Mechanical Engineering and Robotomechanical Systems
  - National Aerospace University "Kharkiv Aviation Institute", Ukraine

**Agenda:** Talks 30 min + 5 min for questions

Welcome 3:00 am-3:05 CET <b>6/27</b>	[10:00 am-10:05 JST <b>6/27</b> , 20:00pm-20:05 CDT <b>6/26]</b>
Prof. Zheng Bo 3:05-3:40 CET	[10:05-10:40 JST, 20:05-20:40 CDT]
Prof. Yang Hui Ying 3:40-4:15 CET	[10:40-11:15 JST, 20:40-21:15 CDT]
Prof. Baranov 4:15 - 4:50 CET	[11:15-11:50 JST, 21:15-21:50 CDT]

### Organizers:

Dr. Peter Ventzek

Prof. Uros Cvelbar

Dr. Kremena Makasheva

Committee Chair: Prof. Seiji Samukawa

## CHAPTER EVENTS

### SENNANO 2023: Call for Papers



**IEEE International Conference on Sensors and Nanotechnology**

26-27 September, 2023, Putrajaya, Malaysia

The IEEE International Conference on Sensors and Nanotechnology (SENNANO) is an annual conference that brings together researchers, academics, and industry professionals from around the world to share the latest advancements and research findings in the fields of sensors and nanotechnology. The conference provides a platform for experts in these fields to exchange ideas, present their latest research, and discuss the challenges and opportunities in the development and application of sensors and nanotechnology.

This Conference is organized by the Malaysia Section Sensors Council and Nanotechnology Council Joint Chapter.

**Important Dates:**

Final paper submission: 15 August 2023

Notification of Acceptance: 31 August 2023

Early Bird registration: 7 September 2023

## YOUNG PROFESSIONALS

### 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 \(Asia and Pacific\)](#)



## CONFERENCES

### MARSS 2023: Call for Papers

**MARSS**

International Conference on Manipulation,  
Automation and Robotics at Small Scales



Abu Dhabi, UAE  
Oct. 09–13, 2023

#### 6th International Conference on Manipulation, Automation and Robotics at Small Scales

9-13 October, 2023, Abu Dhabi, UAE

Website: <https://marss-conference.org>

MARSS, the annual International Conference on Manipulation, Automation and Robotics at Small Scales, is a non-profit conference run by the microrobotic community and technically supported by IEEE-RAS and IEEE-NTC. MARSS2023 will be held in-person on 9-13 October 2023, in Abu Dhabi, UAE. 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 and their applications.

**Important Dates:**

Full paper submission (5-6 pages): 10 July 2023

Short paper Submission (1-3 pages): 10 July 2023

Notification of full paper status: within 2 weeks after the submission

Notification of Short paper status: 2-3 days after the submission

Submission of camera-ready full papers: 10 August 2023

Registration for speakers of full papers: 10 August 2023

Special session proposals: 10 July 2023 (preliminary proposal, OPTIONAL)

Final Special Session proposal: 10 August 2023

Early Bird registration: 10 August 2023

---

### IEEE NANOMED 2023: Call for Papers





**The 16th IEEE International Conference on Nano/Molecular Medicine & Engineering**

**5-8 December 2023, Okinawa, Japan**

**Website:** <https://ieee-nanomed.org/2023/>

Click [here](#) for CFP

IEEE-NANOMED is one of the premier annual events organized by the IEEE Nanotechnology Council (NTC) to bring together physicians, scientists, and engineers alike from all over the world and every sector of academy and industry, working at advancement of basic and clinical research in medical and biological sciences using nano/molecular medicine and engineering methods. IEEE-NANOMED is the conference where practitioners will see nano/molecular medicine and engineering at work in both their own and related fields, from essential and advanced scientific and engineering research and theory to translational and clinical research.

**Conference Scope:**

- Nano and molecular technologies in medical theranostics
- Nanotechnology in drug delivery
- Biomedical imaging
- Bio/Nano sensing
- Biochips and Bio-MEMS
- Biomechatronics
- Biological interface Cells at the nanoscale
- Frontiers in nanobiotechnology
- Translational medicine
- Biomicrofluidics and Bioprinting

**Important Dates:**

Two-Page Abstract Deadline: 15 July 2023

Notification of Acceptance: 10 Sept. 2023

Full-Paper submission Deadline: 20 Oct. 2023

Early Bird Registration: 30 Sept. 2023

## PUBLICATIONS

### IEEE Transactions on Nanotechnology

View the full current issue of IEEE T-NANO

For additional information, visit the [IEEE Xplore website](#).

To learn how to submit to T-NANO, [click here](#).



**T-NANO, VOLUME 22**

### IEEE Open Journal of Nanotechnology

View the full current issue of IEEE OJ-NANO

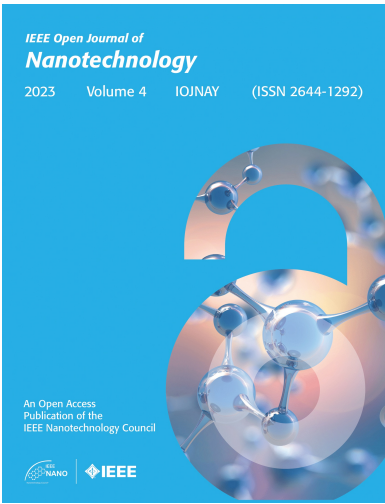
For additional information, visit the [IEEE Xplore website](#).

To find how to submit to OJ-NANO, [click here](#).

The *IEEE Open Journal of Nanotechnology* (OJ-NANO) is dedicated to publishing articles on timely topics in the field of

nanotechnology by making them available immediately, freely, and permanently available to all. All articles published in OJ-NANO are exposed to 5 million unique monthly users of the IEEE *Xplore*® Digital Library. Among numerous articles published so far, we've selected a few review articles to highlight [here](#).

OJNANO, VOLUME 4



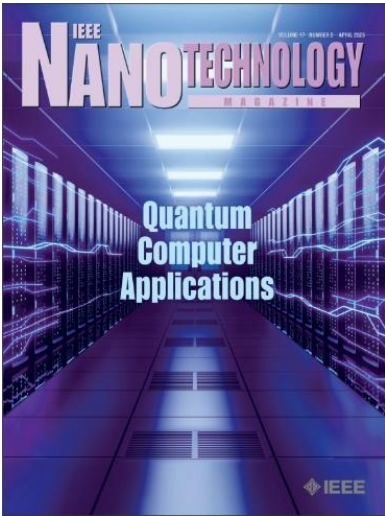
## IEEE Nanotechnology Magazine

View the full current issue of IEEE INM

For additional information, visit the [IEEE Xplore website](#).

To find how to submit to INM, [click here](#).

INM, Volume 17, Number 2



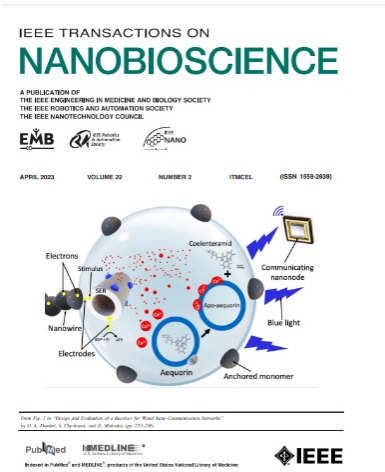
## IEEE Transactions on NanoBioscience

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](#).

T-NB, Volume 22, Number 2



## LIST OF NANOTECHNOLOGY COUNCIL OFFICERS (2023)

Position	Name	Position	Name
President	 Fabrizio Lombardi	Past-President	 James Morris



<b>President-Elect</b>	 <b>Jin-Woo Kim</b>	<b>Vice President for Conferences</b>	 <b>Kremena Makasheva</b>
<b>Vice President for Educational Activities</b>	 <b>Lixin Dong</b>	<b>Vice President-Elect for Educational Activities</b>	 <b>Luca Pierantoni</b>
<b>Vice President for Finances</b>	 <b>Malgorzata Chrzanowska-Jeske</b>	<b>Vice President for Publications</b>	 <b>Supriyo Bandyopadhyay</b>
<b>Vice President-Elect for Publications</b>	 <b>Georgios Sirakoulis</b>	<b>Vice President for Technical Activities</b>	 <b>Xiaoning Jiang</b>
<b>Vice President-Elect for Technical Activities</b>	 <b>Weiqiang Liu</b>	<b>Secretary</b>	 <b>Edward G. Perkins</b>

{{my.Comm Preferences:default=edit me}}

**TAP. CONNECT. NETWORK. SHARE.**  
with the **IEEE App**



[Website](#) | [Privacy Policy](#) | [Contact](#)

Â© {{my.copyright year}} IEEEâ€™ All rights reserved.