



TANN²⁴

PROCEEDINGS OF THE 8TH INTERNATIONAL CONFERENCE ON THEORETICAL AND APPLIED NANOSCIENCE AND NANOTECHNOLOGY (TANN 2024)

June 10, 2024 - June 12, 2024 | Chestnut Conference Centre
University of Toronto, Toronto, Canada

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WELCOME MESSAGE FROM THE CONFERENCE CHAIR

On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the 8th International Conference on Theoretical and Applied Nanoscience and Nanotechnology (TANN 2024).

TANN 2024 is aimed to become one of the leading international annual conferences in the fields related to nanoscience and nanotechnology. This conference will provide excellent opportunities to the scientists, researchers, industrial engineers, and university students to present their research achievements and to develop new collaborations and partnerships with experts in the field.

TANN is a series of international conferences held yearly. These conferences focus on all aspects of Theoretical and Applied Nanoscience and Nanotechnology.

In the Seventh meeting of this conference, two plenary speakers and three keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests. In addition, approximately 18 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 8th International Conference of Theoretical and Applied Nanoscience and Nanotechnology (TANN 2024). We wish you a very successful and enjoyable experience.

Dr. Jin Zhang

Conference Chair

TANN 2024

Dr. Amirkianoosh Kiani

Conference Chair

TANN 2024

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ABOUT TANN 2024

The International Conference of International Conference of Theoretical and Applied Nanoscience and Nanotechnology (TANN 2024) aims to become the leading annual conference in fields related to nanoscience and nanotechnology. The goal of TANN 2024 is to gather scholars from all over the world to present advances in the fields related to nanoscience and nanotechnology and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

TANN is a series of international conferences held yearly. These conferences focus on all aspects of Theoretical and Applied Nanoscience and Nanotechnology. After successfully holding TANN'17 to TANN'23 in Canada, TANN 2024 is hosted in Chestnut Conference Centre - University of Toronto, Toronto, Canada as well this year. TANN 2024 is going to be held in a hybrid format, i.e. in person as well as online.

TANN is an acronym for **T**heoretical, **A**ppplied, **N**anoscience, and **N**anotechnology.

- All papers were peer-reviewed
- The congress proceedings are published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by [Crossref](#)
- The conference proceedings are indexed by [Scopus](#) and [Google Scholar](#)
- The proceedings are permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

 Google Scholar

 Scopus

 Crossref

 PORTICO

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SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the TANN 2024 Conference:



[Dr. Jin Zhang](#)
University of Western
Ontario, Canada
Conference Chair



[Dr. Amirkianoosh Kiani](#)
Ontario Tech
University, Canada
Conference Chair

Scientific Committee Members

- Dr. Daolun Chen, Toronto Metropolitan, Canada
- Dr. Jinju Chen, Newcastle University, UK
- Dr. Byoung-Chul Choi, University of Victoria, Canada
- Dr. Erik Díaz Cervantes, Universidad de Guanajuato, Mexico
- Dr. Tohid Didar, McMaster University, Canada
- Dr. Bernadeta Dobosz, Adam Mickiewicz University, Poland
- Dr. Matiar Howlader, McMaster University, Canada
- Dr. Shahram Karimi, Lambton College of Applied Arts and Technology, Canada
- Dr. Ghada I. Koleilat, Dalhousie University, Canada
- Dr. Harri Lipsanen, Aalto University, Finland
- Dr. Kuldeep Mahato, University of California, San Diego, USA
- Dr. Hande Yöndemli, Selcuk University, Turkey
- Dr. Dejian Zhou, Leeds University, UK

KEYNOTE SPEAKERS

The keynote information for the 8th International Conference of Theoretical and Applied Nanoscience and Nanotechnology (TANN 2024) is as follows:

Plenary Speaker



Dr. Lapo Bogani
University of Oxford, UK



Dr. Devika Chithrani
University of Victoria,
Canada

Keynote Speakers



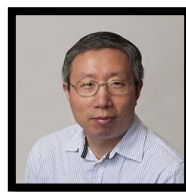
Dr. Alain C. Diebold
University at Albany, USA



Dr. Ray LaPierre
McMaster University,
Canada



Dr. Michael Rogers
University of Guelph,
Canada



Dr. Jin Zhang
Western University, Canada

PLENARY SPEAKER



Titles: Application of Nanotechnology in
Cancer Research

Dr. Devika Chithrani, University of
Victoria, Canada

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Dr. Devika Chithrani was awarded the faculty gold medal and the gold medal for physics when she received her bachelor's degree in physics. She is a recipient of many fellowships by Natural Sciences and Engineering Research Council of Canada during her graduate and post-doctoral work. Now, she is an associate professor at University of Victoria. She leverages nanotechnology to create innovations that advance the care of cancer patients. Her work is featured on the cover of journals and her publications have received over 11,000 citations in few years. She is among the world's top 2% scientists according to the published data by Stanford University. Her passion is to develop smart nanomaterials to improve exiting cancer therapeutics.

KEYNOTE SPEAKER



Titles: Characterization And Metrology Of Si/Si(1-X)Ge(X) Nanoscale Superlattice Film Stacks And Semiconductor Device Structures

Dr. Alain C. Diebold, University at Albany, USA

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Alain Diebold is Professor Emeritus and Empire Innovation Professor of Nanoscale Science in the College of Nanotechnology, Science and Engineering at the University at Albany, SUNY. Professor Diebold maintains an active, funded research program in the materials science of 2D materials and in the characterization and metrology of new semiconductor materials and structures. He is an AVS Fellow and a SPIE Fellow. Significant publications include a Fall 2021 book from Springer Nature entitled the Optical and Electrical Properties of Nanoscale Materials (co-author) and the Handbook of Silicon Semiconductor Metrology (editor and chapter author). Through collaboration with the industrial partners such TEL Technology Center America and Onto Innovations, students and post-doctoral fellows have advanced the characterization and metrology of advanced materials and structures through microscopy, optical, and both laboratory and synchrotron-based X-Ray methods. He authored or co-authored 18 book chapters, nearly 100 peer reviewed journal papers, more than 135 conference proceedings, and given more than 105 invited presentations both domestically and internationally. He remains active in the internal spectroscopic ellipsometry community which provides intellectual inspiration, and more importantly, is the community having many life-long friends.

KEYNOTE SPEAKER



Titles: Semiconductor Nanowires: From Materials to Devices
Dr. Ray LaPierre, McMaster University, Canada

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Ray LaPierre is a Professor in the Engineering Physics Department at McMaster University. He attended Dalhousie University where he obtained a B.Sc. degree in Physics in 1992. He then completed his M.Eng. degree in 1994 and Ph.D. degree in 1997 in the Engineering Physics Department at McMaster University. His graduate work involved development of molecular beam epitaxy of compound semiconductor alloys for laser diodes in telecom applications. Upon completion of his graduate work in 1997, he joined JDS Uniphase (Ottawa, Ontario) where he developed dielectric coatings for wavelength division multiplexing devices. In 2004, he rejoined McMaster University and is currently a full Professor in the Engineering Physics Department. His research interests are focused on III-V nanowires, molecular beam epitaxy, and applications in optoelectronics, including quantum emitters and detectors. He has over 148 publications, 65 invited presentations, and 197 conference presentations related to semiconductor nanowire growth, characterization, and device fabrication. He is a Board Member of the journals, Nano Express and Nanotechnology. He is a member of the Canadian Academy of Engineering.

KEYNOTE SPEAKER



Titles: Self-Assembly Of Small Molecules In Highly Dilute Environments
[Dr. Michael Rogers, University of Guelph, Canada](#)

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Dr. Rogers is a Professor and Tier II Canada Chair in Food Nanotechnology at the University of Guelph, where he studies the underlying mechanisms that facilitate the self-assembly of small molecules. His work appeared on the Covers of Chemical Society Reviews, Langmuir, Nanoscale and Soft Matter and includes >110 peer-reviewed publications, 20 book chapters, and more than 80 conference proceedings. With an H-Index of 42, he has appeared on the World's Top 2% Scientists by Stanford University since 2021 (<https://ecebm.com/2023/10/04/stanford-university-names-worlds-top-2-scientists-2023/>). He has been awarded the Young Scientist Awards through the International Union of Food Science and Technologists and the American Oil Chemists' Society. He was awarded the inaugural Directors Award for Scientific Excellence from the New Jersey Institute of Food Nutrition & Health (IFNH). By mimicking natural structures, he develops a fundamental understanding of how to control the assembly of small molecules into complex materials with applications ranging from foods to biomaterials. Dr. Rogers has held faculty appointments at Rutgers University (Department of Food Science (2011-2015)) and the University of Saskatchewan (Department of Food and Bioproduct Science (2008-2011)) before joining Guelph (2015- present). He is the Editor-in-chief of Food Biophysics (2024 – 2029).

KEYNOTE SPEAKER



Titles: Two-dimensional nanomaterials used in spintronic devices for various applications

[Dr. Jin Zhang, Western University, Canada](#)

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Prof. Jin Zhang is a Full Professor of the Department of Chemical and Biochemical Engineering in the University of Western Ontario (Western University), Canada. She is also cross-appointed to the School of Biomedical Engineering, and the Department of Medical Biophysics. Dr. Zhang's research focuses on exploring diverse hetero-nanostructures for various applications, including sensors, biomedical devices, and spintronic devices, resulting in the publication of over 100 peer-reviewed papers in high-impact journals, including Biosensors & Bioelectronics (IF: 12.6), Nano-Micro Letters (IF: 26.6), Journal of Materials Chemistry B (IF: 7.571), Applied Surface Science. (IF: 6.7). Dr. Zhang's research work has been recognized by prestigious awards, including Early Research Award of Ontario, the Grand Challenges Canada-Canadian Rising Stars in Global Health, Outstanding Mid-Career Achievements in Nanoscience and Nanotechnology in Ontario, etc. She holds several issued patents and patent applications. Dr. J Zhang is an Editor-in-Chief of the Int. J. Nano Biomater. She also acts as Associate Editor for several journals, e.g., IEEE Trans. Nanobioscience

LIST OF PAPERS

The following papers were presented at the 8th International Conference on Theoretical and Applied Nanoscience and Nanotechnology (TANN 2024)

Virtual Session

[Self-Assembly Of Elastin-Suckerin Based Diblock Copolypeptides For Biomedical Applications](#)

Authors: Aamna Basheer, Shahzaib Shahid, Gul Karima, Lubna Ghani

[Work Function Tuning for Junctionless Transistor High-K Gate Material Using Machine Learning Descriptor Engineering](#)

Authors: Sehtab Hossain, Ahmed Fazle Rabbi

[Preparation of 3D Printable Filament Using Brewer's Spent Grain Derived Poly-Lactic Acid Nanocomposites](#)

Authors: Robe Deresse Terfa, Longyan Chen, Xiaoxu Ji, Davide Piovesan

LIST OF PAPERS

Nanomaterials, Characterization and Application

[Fluorinated Electrolyte For High-Voltage Lithium-Ion/Sulfur Chemistry With High Energy Density](#)

Authors: Gebregziabher Brhane Berhe, Wei-Nien Su, Bing Joe Hwang

[Synthesis of Reduced Graphene Oxide from Biomass Sugarcane Dry Leaves by Two-stage Pyrolysis](#)

Authors: Jamal Hassan, Baskar Thangaraja, Pravin Raj Solomonb

[Fabrication of Suspended Stratified Plasmonic Waveguides](#)

Authors: Peter A.C. Neathway, Hui Yuan, Isobel C. Bicket, Erik Dujardin, Gianluigi A. Botton

[UV Spectroscopy Studies On Photosystem \(PS\) II of Freshwater Algae: Under Phosphate Stress](#)

Authors: Dhillippan M. Panneerselvam and Muthukumaran Packirisamy

[Selective and Efficient Electrochemical Conversion of Carbon Dioxide into Formic Acid Using Metal-Based Alloy Nanocatalyst](#)

Authors: Muhammad Arsalan, Nafis Mahmud, Dina Ewis, Muftah H. El-Naas

LIST OF PAPERS

Nanomaterials, Characterization and Application

[Vitreous Pharmacokinetic Of Anti-VEGF Mab Following the Intravitreal Injection of Drug Nanoparticles Embedded In Thermosensitive Sol-Gel](#)

Authors: Reyhaneh Varshochian, Mohammad Riazi-Esfahani

[Bifunctional Cu-Based Catalyst Forfor Electrochemical Conversion Ofof Carbon Dioxide Intointo CO Andand Formate](#)

Authors: Nafis Mahmud, Muhammad Arsalan, Haya N Al Jehani, Muneer M Ba-Abbad, Muftah H. El- Naas

[Preparation of a 3-D Printable Radiopaque Polymer Using Zirconium Oxide Nanomaterial](#)

Authors: Sophia Piatt, Saeed Tiari, Longyan Chen

Poster Session

[Intranasal Delivery of Rivastigmine to Brain: In Silico Designed Nano Drug-Polymer Complexes](#)

Authors: Vinni Kalra, Om Silakari, Ashok Kumar Tiwary

[Effect of Etching Process on the Tribological Properties of 2D \$Ti_3C_2Tx\$ MXenes](#)

Authors: Shuo He, Peter Serles, Nima Bahri, Vijay Harikrishnan, Pulickel Ajayan, Tobin Filleter

[Tuning of Morphology and Plasmonic Properties of Gold Nanoislands through Thermal Budgeting](#)

Authors: Kyana Mohammadi, Duraichelvan Raju, Mahdi Derayatifar, Simona Badilescu, Muthukumaran Packirisamy

SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of TANN 2024:



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JOURNAL PUBLICATION

Selected articles from the conference will be published in the International Journal of Theoretical and Applied Nanotechnology (IJTAN) after a secondary review process.

This journal has adopted to the open-access model, meaning all free access to the journal's articles and content with no need for subscription. This ensures larger audience and therefore higher citations.

All published papers of IJTAN will be submitted to Google Scholar. Additionally, they will be permanently archived in Portico (one of the largest community-supported digital archives in the world) and will be assigned unique DOIs.

Please visit the following website for the respected journal:
IJTAN: <https://ijtan.avestia.com>

TANN 2025

The 9th International Conference of Theoretical and Applied Nanoscience and Nanotechnology (TANN 2025) will be held on July 14, 2025 - July 16, 2025 in Imperial College London Conference Center London, United Kingdom.



For inquiries and to obtain further information on the congress, please visit the [website](http://www.2025.tannconference.com)

You can also email info@tannconference.com or call us at: +1-613-834-9999

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ETHICS & MALPRACTICE

At International ASET Inc., we take matters that relate to ethics in publishing very seriously. We believe that the peer-review publication process is a vital building block of academia, and its integrity must be maintained at all costs, which is why every article will be peer-reviewed by several experts in the field. Under peer-review, experts in the related fields are required to provide opinions and comments on the improvements of the submissions.

We are proud of our efforts towards abiding by the guidelines of ethics, integrity, and high standards in publishing.

Following are the ethics guidelines set by the organizers for the authors and the reviewers of the conference:

Scientific Committees

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link: [Scientific Committee](#)

Equality and Decisions

One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originally, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

Confidentiality

Scientific committee member(s) and publishing staff may not disclose manuscripts or their content, directly or indirectly, to anyone other than individuals invited to review the manuscript (whether they accept or not), other reviewers of the same publications, and publishing staff.

Conflicts of Interest

Scientific committee member(s) and publishing staff may not utilize the contents of submitted manuscripts whether accepted or rejected, directly or indirectly for their own research purposes without prior written consent by the authors.

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Reviewers

Contribution to Decisions

In order for final decisions to be made regarding acceptance or rejection of papers, we rely on peer-review. Peer-review is the process of experts in the field reading, understanding, and objectively commenting on submitted papers. Through peer-review, scholars give back to the academic and scientific community by helping the chair(s) make decisions regarding manuscripts.

Promptness

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

Acknowledgment of Source

The reviewer should notify the chair(s) if they find any similarities in the paper being reviewed and any other work that has been published previously.

Confidentiality

Reviewers must not share the contents of the manuscripts they receive for review, regardless of their decision to review or contents of the review, directly or indirectly, with anyone other than the person who has assigned the review.

Fairness

Reviewers should review manuscripts fairly and objectively, with supporting evidence or arguments, regardless of personal feelings or biases.

Conflicts of Interest:

Invited reviewers should immediately inform the chair(s) in case of a conflict of interest based on competitive, collaborative, personal, family, and other relationships with the authors or people involved in the work.

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Authors

Reporting Standards

The paper being submitted for the proceedings should be based on clear objective, discussion, and references. The findings, data, and the arguments being used in the paper should be accurate. It is author's responsibility to guarantee the authenticity of the data in the paper.

Authorship

Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

Acknowledgement of Source

Acknowledgement to other's work being used in the paper must be given at all times. Authors of the paper should give comprehensive credit where it is necessary, by citing the work, they use for supporting their own research.

Accuracy, Originality, and Plagiarism

Authors should describe their work and the results of their work accurately and in full. The level of provided accuracy and detail should be such that a reader can replicate the work independently. Inaccurate, incomplete, fraudulent, and misleading statements are considered unacceptable and unethical. Direct or indirect use of other people's work is not allowed, unless properly cited. Previous works that have influenced the current work should also be cited. Presenting someone else's work as one's own is strictly prohibited and is considered plagiarism.

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Authors are encouraged to share their data, software, or other sharable material online, provided copyright and ownership laws surrounding that particular project permit. Authors may also be asked to share such material with the chair(s), and/or reviewers, and must be willing to do so if asked.

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Dual Submissions

Submitting a manuscript to more than one venue (conference, journal, etc) simultaneously is not allowed. Presenting previously published work to be considered as a new submission, without a significant new interpretation or analysis, is prohibited.

Conflicts of Interest

Authors must notify the chair(s) at the time of submission, if any factor outside the scope of the research has influenced any step of the work and manuscript writing. Examples of such factors include but are not limited to funding, grants, advisory and consultancy, stock ownership, current or past employment, and memberships, among others. All funding sources should be disclosed in the manuscript.

Animal and Human Subjects

Works involving human and/or animal subjects must ensure that the work has abided by institutional guidelines, and pre-approved by required bodies. Moreover, consent must be acquired from participants, and privacy of subjects must be ensured. All of the above must be specified with clear statements in the manuscript.

Hazardous Material

It should clearly be identified in the manuscripts if the works have involved hazardous chemicals and material, or devices that can be harmful.

Reporting of Mistakes, Errata, and Retractions

If an author identifies a major error in a published paper, he/she must immediately inform the publisher. Regardless of whether a significant error is reported by the authors of the work or other readers, authors are obligated to take the necessary steps to correct the issue. It is decided on a case-by-case basis whether an erratum will be submitted to notify future readers of the error and correction, or whether the paper will be retracted. Unethical/plagiarism issues mostly result in a retraction, while unintended mistakes will mostly result in the publication of an erratum.

ETHICS & MALPRACTICE

Publisher

Errata and Retractions

The publisher takes the necessary steps to prevent mistakes, academic and scientific misconduct, and unethical behavior, both intended and unintended. When mistakes are reported, the publisher works with chair(s) and authors to publish an erratum clarifying the issue. In cases where the mistakes are severe and significant, the paper might be retracted. If unethical behavior, plagiarism, academic and scientific misconduct, or other such activities are proven to have taken place by an author or authors, the publisher will retract the paper.

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Ownership and Management:

This conference-proceedings is managed and operated by the International ASET (International Academy of Science, Engineering, and Technology) and Avestia Publishing (the publishing arm of ASET).

Schedule:

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.

CONTACT US

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