

Athens Journal of Sciences

Quarterly Academic Periodical, Volume 12, Issue 1

Published by the Athens Institute

URL: <https://www.athensjournals.gr/ajs> Email: journals@atiner.gr

e-ISSN: 2241-8466 DOI: 10.30958/ajs

March 2025

Athens Journal of Sciences

Quarterly Academic Periodical, Volume 12, Issue 1, March 2025

Published by the Athens Institute

URL: <https://www.athensjournals.gr/ajs> Email: journals@atiner.gr

e-ISSN: 2241-8466 DOI: 10.30958/ajs

Front Pages

*MOHAMMAD A. SHBOOL, YARA ALTARAWNEH, RAGHAD BANI HAMAD,
RAND ALQA'AYDEH, MOHAMMAD D. AL-TAHAT,
THAHABIA ABEDELJAWAD & MOHAMMED J. K. BASHIR*

[Predictive Modeling of Chemical Waste Generation in Healthcare Facilities: Enhancing Waste Management Strategies](#)

*CARMELIA MARIANA BĂLĂNICĂ DRAGOMIR, CORNELIA MARIN
& CRISTINA GARLEA*

[Green Taxes and their Impact on Romanian's Economy compared to Investments for Air and Climate Protection](#)

STEFAN GANDEV, PLAMEN IVANOV, ANGEL DIMITROV & PENKA FILYOVA
[Cleft Grafting Propagation of Pome and Stone Fruit
Trees during the Dormancy Period in a Hot Water System](#)

THOMAS FEHLMANN & EBERHARD KRANICH

[How to Teach Literacy to Artificial Neural Networks
Making AI intelligent by Learning from other Disciplines](#)

Athens Journal of Sciences

Published by the Athens Institute

Editors

- **Dr. Ampalavanar Nanthakumar**, Director, Sciences Division, Athens Institute & Professor, State University of New York (Oswego), USA.
- **Dr. Nikolaos Dimakis**, Deputy Director, Sciences Division, Athens Institute & Professor and Chair, Department of Physics and Astronomy, University of Texas Rio Grande Valley, USA. (Physics)
- **Dr. Nadhir Al-Ansari**, Vice President of Projects, Athens Institute & Professor, Lulea University of Technology, Sweden. (Soil Mechanics)
- **Dr. Adrian Ionescu**, Head, Computer Science Unit, Athens Institute & Professor, Wagner College, USA. (Mathematics & Computer)
- **Dr. Haiduke Sarafian**, Head, Natural Sciences Unit, Athens Institute & Professor of Physics and Endowed Chair of John T. and Paige S. Smith Professor of Science, Pennsylvania State University, USA. (Physics)
- **Dr. Codruta Simona Stoica**, Head, Mathematics & Statistics Unit, Athens Institute & Professor and Vice-Rector, Aurel Vlaicu University of Arad, Romania. (Mathematics & Statistics)
- **Dr. Teodoro Georgiadis**, Deputy Head, Environment Unit, Athens Institute & Senior Research Associate, CNR – IBE, Italy. (Environment)
- **Dr. Evangelia Kotsikorou**, Deputy Head, Natural Sciences Unit, Athens Institute & Associate Professor, The University of Texas Rio Grande Valley, USA. (Chemistry)

<https://www.athensjournals.gr/ajs/eb>

Administration of the Journal

1. Vice President of Publications: Dr Zoe Boutsoli
2. General Managing Editor of all Athens Institute's Publications: Ms. Afrodete Papanikou
3. ICT Managing Editor of all Athens Institute's: Mr. Kostas Spyropoulos
4. Managing Editor of this Journal: Ms. Olga Gkounta ([bio](#))

Athens Institute is an Athens-based World Association of Academics and Researchers based in Athens. Athens Institute is an independent and non-profit Association with a Mission to become a forum where Academics and Researchers from all over the world can meet in Athens, exchange ideas on their research and discuss future developments in their disciplines, as well as engage with professionals from other fields. Athens was chosen because of its long history of academic gatherings, which go back thousands of years to Plato's Academy and Aristotle's Lyceum. Both these historic places are within walking distance from Athens Institute's downtown offices. Since antiquity, Athens was an open city. In the words of Pericles, Athens "...is open to the world, we never expel a foreigner from learning or seeing". ("Pericles' Funeral Oration", in Thucydides, The History of the Peloponnesian War). It is Athens Institute's mission to revive the glory of Ancient Athens by inviting the World Academic Community to the city, to learn from each other in an environment of freedom and respect for other people's opinions and beliefs. After all, the free expression of one's opinion formed the basis for the development of democracy, and Athens was its cradle. As it turned out, the Golden Age of Athens was in fact, the Golden Age of the Western Civilization. Education and (Re)searching for the 'truth' are the pillars of any free (democratic) society. This is the reason why Education and Research are the two core words in Athens Institute's name.

The Athens Journal of Sciences (AJS) is an Open Access quarterly double-blind peer reviewed journal and considers papers from all areas of Natural & Formal Sciences, including papers on agriculture, computer science, environmental science, materials science, transportation science, chemistry, physics, mathematics and statistics, biology, geography, and earth science (geology, oceanography, astronomy, meteorology). Many of the papers published in this journal have been presented at the various conferences sponsored by the [Natural & Formal Sciences Division](#) of the Athens Institute. All papers are subject to Athens Institute's [Publication Ethical Policy and Statement](#).

Athens Journal of Sciences
ISSN NUMBER: 2241-8466 - DOI: 10.30958/ajs
Volume 12, Issue 1, March 2025
Download the entire issue ([PDF](#))

Front Pages i-viii

[Predictive Modeling of Chemical Waste Generation in Healthcare Facilities: Enhancing Waste Management Strategies](#) 9

*Mohammad A. Shbool, Yara Altarawneh, Raghad Bani Hamad,
Rand Alqa'aydeh, Mohammad D. Al-Tahat,
Thahabia Abedeljawad & Mohammed J. K. Bashir*

[Green Taxes and their Impact on Romanian's Economy compared to Investments for Air and Climate Protection](#) 33

*Carmelia Mariana Bălănică Dragomir, Cornelia Marin
& Cristina Garlea*

[Cleft Grafting Propagation of Pome and Stone Fruit Trees during the Dormancy Period in a Hot Water System](#) 49

Stefan Gandev, Plamen Ivanov, Angel Dimitrov & Penka Filyova

[How to Teach Literacy to Artificial Neural Networks Making AI intelligent by Learning from other Disciplines](#) 59

Thomas Fehlmann & Eberhard Kranich

Athens Journal of Sciences

Editorial and Reviewers' Board

Editors

- **Dr. Ampalavanar Nanthakumar**, Director, Sciences Division, Athens Institute & Professor, State University of New York (Oswego), USA.
- **Dr. Nikolaos Dimakis**, Deputy Director, Sciences Division, Athens Institute & Professor and Chair, Department of Physics and Astronomy, University of Texas Rio Grande Valley, USA. (Physics)
- **Dr. Nadhir Al-Ansari**, Vice President of Projects, Athens Institute & Professor, Lulea University of Technology, Sweden. (Soil Mechanics)
- **Dr. Adrian Ionescu**, Head, Computer Science Unit, Athens Institute & Professor, Wagner College, USA. (Mathematics & Computer)
- **Dr. Haiduke Sarafian**, Head, Natural Sciences Unit, Athens Institute & Professor of Physics and Endowed Chair of John T. and Paige S. Smith Professor of Science, Pennsylvania State University, USA. (Physics)
- **Dr. Codruta Simona Stoica**, Head, Mathematics & Statistics Unit, Athens Institute & Professor and Vice-Rector, Aurel Vlaicu University of Arad, Romania. (Mathematics & Statistics)
- **Dr. Teodoro Georgiadis**, Deputy Head, Environment Unit, Athens Institute & Senior Research Associate, CNR – IBE, Italy. (Environment)
- **Dr. Evangelia Kotsikorou**, Deputy Head, Natural Sciences Unit, Athens Institute & Associate Professor, The University of Texas Rio Grande Valley, USA. (Chemistry)

- Dr. Colin Scanes, Academic Member, ATINER & Emeritus Professor, University of Wisconsin Milwaukee, USA.
- Dr. Dimitris Argyropoulos, Professor, North Carolina State University, USA.
- Dr. Cecil Stushnoff, Emeritus Professor, Colorado State University, USA.
- Dr. Hikmat Said Hasan Hilal, Academic Member, ATINER & Professor, Department of Chemistry, An-Najah N. University, Palestine.
- Dr. Jean Paris, Professor, Polytechnique Montreal, Canada.
- Dr. Shiro Kobayashi, Academic Member, ATINER & Distinguished Professor, Kyoto Institute of Technology, Kyoto University, Japan.
- Dr. Jose R. Peralta-Videa, Academic Member, ATINER & Research Specialist and Adjunct Professor, Department of Chemistry, The University of Texas at El Paso, USA.
- Dr. Jean-Pierre Bazureau, Academic Member, ATINER & Professor, Institute of Chemical Sciences of Rennes ICSR, University of Rennes 1, France.
- Dr. Mohammed Salah Aida, Professor, Taibah University, Saudi Arabia.
- Dr. Zagabathuni Venkata Panchakshari Murthy, Academic Member, ATINER & Professor/Head, Department of Chemical Engineering, Sardar Vallabhbhai National Institute of Technology, India.
- Dr. Alexander A. Kamnev, Professor, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Russia.
- Dr. Carlos Nunez, Professor, Physics Department, University of Wales Swansea, UK.
- Dr. Anastasios Koulaouzidis, Academic Member, ATINER & Associate Specialist and Honorary Clinical Fellow of the UoE, The Royal Infirmary of Edinburgh, The University of Edinburgh, UK.
- Dr. Francisco Lopez-Munoz, Professor, Camilo Jose Cela University, Spain.
- Dr. Yiannis Papadopoulos, Professor of Computer Science, Leader of Dependable Systems Research Group, University of Hull, UK.
- Dr. Joseph M. Shostell, Professor and Department Head, Math, Sciences & Technology Department, University of Minnesota Crookston, USA.
- Dr. Abdel-Badeeh M. Salem, Academic Member, ATINER & Professor of Computer Science, Faculty of Computer and Information Sciences, Ain Shams University, Egypt.
- Dr. Ibrahim A. Hassan, Professor of Environmental Biology, Faculty of Science, Alexandria University, Egypt & Centre of Excellence in Environmental Studies, King Abdulaziz University, Saudi Arabia.
- Dr. Laurence G. Rahme, Associate Professor, Department of Surgery, Microbiology and Immunobiology, Harvard Medical School, Boston, Massachusetts & Director of Molecular Surgical Laboratory, Burns Unit, Department of Surgery, Massachusetts General Hospital, USA.
- Dr. Stefano Falcinelli, Academic Member, ATINER & Associate Professor, Department of Civil and Environmental Engineering, University of Perugia, Italy.
- Dr. Mitra Esfandiarei, Academic Member, ATINER & Assistant Professor, Midwestern University, USA.
- Dr. Jonah Lissner, Visiting Professor, Technion – Israel Institute of Technology, Israel.
- Dr. Athina Meli, Academic Member, Academic Member, ATINER, Visiting Scientist and Research Scholar, University of Gent & University of Liege, Belgium and Ronin Institute Montclair, USA.

- **Vice President of Publications:** Dr Zoe Boutsiori
- **General Managing Editor of all Athens Institute's Publications:** Ms. Afrodete Papanikou
- **ICT Managing Editor of all Athens Institute's Publications:** Mr. Kostas Spyropoulos
- **Managing Editor of this Journal:** Ms. Olga Gkounta ([bio](#))

Reviewers' Board

[Click Here](#)

President's Message

All Athens Institute's publications including its e-journals are open access without any costs (submission, processing, publishing, open access paid by authors, open access paid by readers etc.) and is independent of presentations at any of the many small events (conferences, symposiums, forums, colloquiums, courses, roundtable discussions) organized by Athens Institute throughout the year and entail significant costs of participating. The intellectual property rights of the submitting papers remain with the author. Before you submit, please make sure your paper meets the [basic academic standards](#), which includes proper English. Some articles will be selected from the numerous papers that have been presented at the various annual international academic conferences organized by the different divisions and units of the Athens Institute for Education and Research. The plethora of papers presented every year will enable the editorial board of each journal to select the best, and in so doing produce a top-quality academic journal. In addition to papers presented, Athens Institute will encourage the independent submission of papers to be evaluated for publication.

The current issue is the first of the twelfth volume of the *Athens Journal of Sciences (AJS)*, published by [Natural & Formal Sciences Division](#) of Athens Institute.

Gregory T. Papanikos
President
Athens Institute



Athens Institute for Education and Research

A World Association of Academics and Researchers

13th Annual International Conference on Chemistry 21-24 July 2025, Athens, Greece

The [Natural Sciences Unit](#) of Athens Institute, will hold its **13th Annual International Conference on Chemistry, 21-24 July 2025, Athens, Greece** sponsored by the [Athens Journal of Sciences](#). The aim of the conference is to bring together academics and researchers of all areas of chemistry and other related disciplines. You may participate as stream organizer, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (<https://www.atiner.gr/2025/FORM-CHE.doc>).

Academic Members Responsible for the Conference

- **Dr. Haiduke Sarafian**, Head, [Natural Sciences Unit](#), ATINER & Professor of Physics and Endowed Chair of John T. and Paige S. Smith Professor of Science, Pennsylvania State University, USA.

Important Dates

- Abstract Submission: **1 April 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **23 June 2025**

Social and Educational Program

The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Athens Institute.

- Greek Night Entertainment (This is the official dinner of the conference)
- Athens Sightseeing: Old and New-An Educational Urban Walk
- Social Dinner
- Mycenae Visit
- Exploration of the Aegean Islands
- Delphi Visit

Conference Fees

Conference fees vary from 400€ to 2000€
Details can be found at: <https://www.atiner.gr/fees>



Athens Institute for Education and Research

A World Association of Academics and Researchers

13th Annual International Conference on Physics 21-24 July 2025, Athens, Greece

The [Natural Sciences Unit](#) of Athens Institute, will hold its **13th Annual International Conference on Physics, 21-24 July 2025, Athens, Greece** sponsored by the [Athens Journal of Sciences](#). The aim of the conference is to bring together academics and researchers of all areas of physics and other related disciplines. Please submit a proposal using the form available (<https://www.atiner.gr/2025/FORM-PHY.doc>).

Important Dates

- Abstract Submission: **1 April 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **23 June 2025**

Academic Member Responsible for the Conference

- **Dr. Haiduke Sarafian**, Head, [Natural Sciences Unit](#), ATINER & Professor of Physics and Endowed Chair of John T. and Paige S. Smith Professor of Science, Pennsylvania State University, USA.

Social and Educational Program

The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Athens Institute.

- Greek Night Entertainment (This is the official dinner of the conference)
- Athens Sightseeing: Old and New-An Educational Urban Walk
- Social Dinner
- Mycenae Visit
- Exploration of the Aegean Islands
- Delphi Visit
- Ancient Corinth and Cape Sounion

More information can be found here: <https://www.atiner.gr/social-program>

Conference Fees

Conference fees vary from 400€ to 2000€

Details can be found at: <https://www.atiner.gr/fees>