

Athens Journal of Sciences

Quarterly Academic Periodical, Volume 9, Issue 1, March 2022

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

Email: journals@atiner.gr

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



Front Pages

ANASTASIA NIKOLOGIANI, ALESSANDRO BETTA, MATTIA
ANDREOLA, ANGELICA PIANEGONDA, GIAN ANTONIO BATTISTEL,
ANNA TERNELL & ALESSANDRO GRETTA

[Urban Farming Models, Ecosystems and Climate Change Adaptation in
Urban Environments: The Case of SATURN Pan European Programme](#)

JOHN M. MEDELLIN

[Generation, Regeneration and Validation of Binary Secret Keys through
Blockchain in IoT Devices](#)

THOMAS FEHLMANN & EBERHARD KRANICH

[The Fixpoint Combinator in Combinatory Logic - A Step towards
Autonomous Real-time Testing of Software?](#)

HAO TSAI & ERH-TSUNG CHIN

[Pupil's Fraction Learning based on Board Game Playing](#)

Athens Journal of Sciences

Published by the Athens Institute for Education and Research (ATINER)

Editors

- Dr. Christopher Janetopoulos, Head, [Biology Unit](#), ATINER & Associate Professor, University of the Sciences, USA.(Biology)
- Dr. Ethel Petrou, Academic Member, ATINER & Professor and Chair, Department of Physics, Erie Community College-South, State University of New York, USA.
- Dr. Ellene Tratras Contis, Head, [Chemistry Unit](#), ATINER & Professor of Chemistry, Eastern Michigan University, USA.(Chemistry)

Editorial & Reviewers' Board

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

Administration of the Journal

1. Vice President of Publications: Dr Zoe Boutsoli
2. General Managing Editor of all ATINER's Publications: Ms. Afrodete Papanikou
3. ICT Managing Editor of all ATINER's Publications: Mr. Kostas Spyropoulos
4. Managing Editor of this Journal: Ms. Olga Gkounta

ATINER is an Athens-based World Association of Academics and Researchers based in Athens. ATINER 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 ATINER'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 ATINER'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 ATINER'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 for Education and Research (ATINER). All papers are subject to ATINER's [Publication Ethical Policy and Statement](#).

The Athens Journal of Sciences

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

Volume 9, Issue 1, March 2022

Download the entire issue ([PDF](#))

<u>Front Pages</u>	i-viii
<u>Urban Farming Models, Ecosystems and Climate Change Adaptation in Urban Environments: The Case of SATURN Pan European Programme</u> <i>Anastasia Nikologianni, Alessandro Betta, Mattia Andreola, Angelica Pianegonda, Gian Antonio Battistel, Anna Ternell & Alessandro Gretter</i>	9
<u>Generation, Regeneration and Validation of Binary Secret Keys through Blockchain in IoT Devices</u> <i>John M. Medellin</i>	25
<u>The Fixpoint Combinator in Combinatory Logic - A Step towards Autonomous Real-time Testing of Software?</u> <i>Thomas Fehlmann & Eberhard Kranich</i>	47
<u>Pupil's Fraction Learning based on Board Game Playing</u> <i>Hao Tsai & Erh-Tsung Chin</i>	65

Athens Journal of Sciences

Editorial and Reviewers' Board

Editors

- **Dr. Christopher Janetopoulos**, Head, [Biology Unit](#), ATINER & Associate Professor, University of the Sciences, USA.(Biology)
- **Dr. Ethel Petrou**, Academic Member, ATINER & Professor and Chair, Department of Physics, Erie Community College-South, State University of New York, USA.
- **Dr. Ellene Tratras Contis**, Head, [Chemistry Unit](#), ATINER & Professor of Chemistry, Eastern Michigan University, USA.(Chemistry)

Editorial Board

- 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. Panagiotis Petratos, Professor, California State University-Stanislaus, USA.
- 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. 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. 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 Boutsoli
- **General Managing Editor of all ATINER's Publications:** Ms. Afrodete Papanikou
- **ICT Managing Editor of all ATINER's Publications:** Mr. Kostas Spyropoulos
- **Managing Editor of this Journal:** Ms. Olga Gkounta ([bio](#))

Reviewers' Board

[Click Here](#)

President's Message

All ATINER'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 ATINER 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, ATINER will encourage the independent submission of papers to be evaluated for publication.

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

Gregory T. Papanikos, President, ATINER.



Athens Institute for Education and Research *A World Association of Academics and Researchers*

10th Annual International Conference on Chemistry **18-21 July 2022, Athens, Greece**

The [Chemistry Unit](#) of ATINER, will hold its **10th Annual International Conference on Chemistry, 18-21 July 2022, 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/2022/FORM-CHE.doc>).

Academic Members Responsible for the Conference

- **Dr. Ellene Tratras Contis**, Head, Chemistry Unit, ATINER & Professor of Chemistry, Eastern Michigan University, USA.

Important Dates

- Abstract Submission: **28 March 2022**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **20 June 2022**

Social and Educational Program

The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Atiner.

- 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

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*

10th Annual International Conference on Physics 18-21 July 2022, Athens, Greece

The [Physics Unit](#) of ATINER, will hold its **10th Annual International Conference on Physics, 18-21 July 2022, 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/2022/FORM-PHY.doc>).

Important Dates

- Abstract Submission: **28 March 2022**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **20 June 2022**

Academic Member Responsible for the Conference

- **Dr. Ethel Petrou**, Academic Member, ATINER & Professor and Chair, Department of Physics, Erie Community College-South, State University of New York, USA.
- **Dr. Bala Maheswaran**, Head, Electrical Engineering Unit, ATINER & Professor, Northeastern University, USA.

Social and Educational Program

The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Atiner.

- 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>

