



Note

SECOND SOUTHERN SCIENCE CONFERENCE - INTERNATIONAL SCIENTIFIC CONFERENCE – 2024

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ABSTRACT

Background: Scientific conferences play a vital role in knowledge exchange and collaboration across disciplines. Building on the success of its 2022 inaugural event, the Second Southern Science Conference (SSCON 2024) aimed to expand international scientific collaboration while addressing contemporary challenges in sustainability and research methodology. **Aims:** To evaluate the effectiveness of a hybrid conference format in facilitating global scientific collaboration and to showcase cutting-edge research across multiple disciplines, with particular emphasis on sustainability and technological innovation in Latin America. **Methods:** The conference implemented a hybrid format combining in-person and virtual attendance. Over three days, 38 lectures were presented by renowned researchers, covering key topics including materials science, environmental sustainability, chemical processes, and regional development. Participation metrics and collaboration patterns were analyzed to assess the conference's impact. **Results:** The conference achieved significant participation with 242 contributing authors from 13 countries across four continents. Notable research presentations included advances in laser surface modification techniques, geotechnology applications in biofuel production, sustainable silica synthesis from biomass, and green valorization of tropical seeds. The conference produced 66 approved papers, with most involving 2-5 collaborators. **Discussion:** The hybrid format proved effective in removing geographical barriers and promoting global engagement. The strong representation from Latin American institutions highlighted the region's growing influence in international scientific discourse. Key research presentations demonstrated innovative approaches to sustainability challenges, particularly in waste utilization and environmental technology. **Conclusion:** SSCON 2024 successfully evolved from its predecessor, demonstrating the effectiveness of hybrid conferencing in fostering international scientific collaboration. The conference established itself as a vital platform for knowledge exchange, particularly in sustainability and technological innovation, while identifying areas for future improvement such as extended submission timelines and permanent management structures.

Keywords: *Conference, Evolution, Hybrid format, Collaboration, Cutting-edge research and technology, Sustainability.*

1. INTRODUCTION

In my previous editorial (Peláez, 2022), I addressed the readers of the Southern Science Journal and committed myself to put all my efforts to make both the Southern Science Conference and the Southern Science Conference grow and evolve. Today, looking back on what has happened, I can say that the effort has paid off, but that I need to keep working and focusing my energy to continue moving towards a more globalized and interrelated world. To the best of my knowledge, evolutionary changes in living beings occur due to mutations that produce the appearance of individuals who are better

adapted to their environment (Darwin, 1859). These also happen in scientific journals and events, where the most adapted ones remain in time and are recognized by their peers. In our case, the Second Southern Science Conference evolved and grew greatly in 2024 in comparison with the first edition in 2022 (Southern Brazilian Journal of Chemistry, 2022; Second Southern Science Conference, 2024a), incorporating new institutions and collaborators from different parts of the world, strengthening the network that only scientific knowledge and its dissemination can achieve.

The hybrid format of the SSSCON 2024, significantly influenced participation rates in several ways, one of the most important ways was broadening the local and international participation in comparison with the first edition (Southern Brazilian Journal of Chemistry, 2022; Second Southern Science Conference, 2024a). In this occasion, the hybrid program allowed both in-person and virtual attendance to engage in the conference. This was crucial for the promotion of global scientific collaboration and knowledge exchange, as it removes geographical barriers that might have limited attendance in a traditional format. In this event, more than 240 authors from different countries and 4 continents shared their knowledge and research, Figure 1.



Figure 1. SSSCON 2024 Participating Countries: Argentina, Brazil, Georgia, India, Iraq, Ireland, Mexico, Nigeria, Portugal, Russia, Spain, United States, and France

2. Selected lectures given by renowned researchers

During the three days of the conference, 38 lectures were given by renowned researchers on different topics proposed by the Scientific committee (Second Southern Science Conference, 2024b). All of them turned out to be of a high level, but I have selected a few representative speeches to perform some comments, belonging all of them to the following key topics: Materials science, Environmental sustainability, Chemical processes and development and Regional Development and Sustainability.

In the lecture titled **Materials surface modification by pulsed laser techniques**, **Prof. Dr. Maximiliano Rossa** (Rossa, n.d.) commented that his research primarily focuses on the fields of Physical Chemistry and Laser Chemistry, with a particular emphasis on Molecular Reaction Dynamics, Laser Techniques in Material Processing and Surface Modification. His research involves studying various gas-phase physical and chemical processes, especially those involving metal-containing species and clusters, as well as s-heptazine derivatives. This research aims to understand the fundamental mechanisms of molecular interactions and reactions in different environments. In his conference, Prof. demonstrates how specific laser techniques can modify the surface characteristics of polymer films. For instance, the Surface Bio-Inspired (SBI) technique can increase surface roughness or create micro-foams and craters on polymer surfaces. Additionally, the Direct Laser Interference Patterning (DLIP) technique is noted for its ability to produce precise periodic patterns on polymer films, which can enhance properties like fluorescence and wettability. Overall, Dr. Rossa's research integrates advanced laser techniques with molecular dynamics to innovate in the processing and application of polymeric materials, showcasing the potential for significant advancements in material science.

The use of geotechnologies in monitoring new raw materials for biofuel production was

lecture performed by **Prof. Dr. Anna Claudia dos Santos** (Santos, n.d.) . Prof. Santos commented that the purpose of her Study is based on the Role of Geotechnologies for addressing challenges in biofuel production, highlighting the use of satellite imagery and spatial analysis as essential tools and emphasizes the importance of compliance with environmental policies, such as Brazil's *RenovaBio*, which aims to reduce greenhouse gas emissions through biofuels. Also, Dr. establish that remote sensing technologies provide critical insights for decision-making, including identifying optimal cultivation zones, ensuring compliance with environmental regulations, and assessing carbon sequestration potential. Also, Prof. Santos comments that this data-driven approach promotes the diversification of feedstocks and minimizes environmental impacts. As an important point, during the conference Brazil is presented as a prime example of integrating geotechnologies into biofuel production due to its vast and diverse territory. Also, it was stated that the country has a strong foundation for innovation in bioenergy, supported by strategic use of geospatial tools to monitor feedstocks and production systems.

Summary of the conference **Silica synthesis from biomass: sustainable use of agro-industrial waste, performed by Prof. Dr. Denise Alves Fungaro** (Fungaro, n.d.). In her speech, Prof. Fungaro discusses the sustainable use of waste for silica synthesis, emphasizing the importance of converting agricultural waste into valuable materials. The research highlights the significant amounts of biomass waste generated from agribusiness activities. The sol-gel technique is highlighted as a key method for synthesizing silica nanoparticles (SiNPs). The synthesis of SiNPs involves extracting silica from biomass waste, primarily through chemical methods, which allow for better control over the size and morphology of the particles. In addition, Prof. discusses about the applications of SiNPs due to their unique properties, such as stability and high surface area and their potential use in environmental remediation, including wastewater treatment and carbon capture, showcasing the value-added products that can be derived from agricultural waste.

In the lecture titled **Green valorization of highly underutilized tropical seeds as nutricosmeceutics and dermocosomeceutics, Prof. Dr. Atolani Olubunmi** (Olubunmi, n.d.) explores an innovative green synthetic route for the direct characterization of various underutilized tropical seeds. He emphasizes the potential of these seeds in developing plant-based cosmetics and nutricosmetics, aligning with sustainable development goals (SDGs). For his research utilized multistep and direct methylbutylation to obtain lipid and fatty acid methyl and butylisobutyl esters from the seeds, which were characterized using Fourier Transform Infrared Spectroscopy and Gas Chromatography-Mass Spectrometry. Prof. point out that the study also adopted principles of green chemistry to create cosmetics that are biodegradable and free from synthetic additives. Dr. Atolania highlight the development of natural cosmetics that are effective and cost-efficient compared to commercial products and also stated that these cosmetics are entirely plant-based and do not contain artificial antibiotics, colorings, fragrances, or preservatives, making them a safer choice for consumers.

3. Key Conclusions of the Second Southern Science Conference – 2024 edition.

More than a few important conclusions regarding the Second Southern Science Conference and its impact on international scientific community can be obtained. These are the main outcomes:

- **Effectiveness of Hybrid Format:** The conference successfully utilized a hybrid format, combining in-person and virtual attendance. This approach facilitated broader international participation and knowledge exchange, proving effective in fostering global scientific collaboration while addressing contemporary challenges.
- **Significant Participation Metrics:** The conference achieved notable participation metrics, with 65 approved papers and 242 contributing authors. This indicates a strong interest and engagement from the scientific community, particularly from Latin American institutions, which showcased their growing influence in international scientific dissertation.
- **Collaboration Patterns:** Most papers presented at the conference involved 2-5 collaborators, highlighting effective research collaboration patterns. The *Universidade de Vassouras*, *Universidad de Mendoza* and the *INFIQC-CONICET-Universidad Nacional de Córdoba* were

recognized as the leading institutions, reflecting its long-standing legacy of academic excellence.

- **Future Directions:** The success of this conference supports the planning of future iterations, with the next edition scheduled to be held in Vassouras (Universidade de Vassouras 2026), Brazil. Areas for improvement were identified, such as extending submission timelines and establishing a permanent management committee to enhance future events.
- **International Scientific Collaboration:** The conference underscored the growing importance of international scientific collaboration in addressing global challenges. It highlighted the significant contributions of Latin American institutions across various fields of research, reinforcing the need for cross-border academic partnerships.

4. References

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5. DECLARATIONS

5.1. Study Limitations

The note is limited to its content.

5.2. Acknowledgements

As Editor in chief of the Southern Science Journal I express my gratitude to all the invited speakers, to the authors of papers to be published in the Southern Science Journal and Tche Quimica, to the authors of posters, to all the participants (present and virtual) and to all the scientific community in general. I look forward to meeting you at the next event at the Third Southern Science Conference at the University of Vassouras in 2026.

5.3. Funding source

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5.4. Competing Interests

The author participated in the conference and was extremely well-received in Argentina. Therefore, this amazing impression may have limited his judgment.

5.5. Open Access

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5.6. AI Usage Declaration

This manuscript was developed with the assistance of artificial intelligence tools. Specifically, Claude AI (Anthropic) was used to help organize and structure the content. All information and data presented are accurate and were verified by the author, with the AI serving only as a writing and organization aid. The final content, analysis, and conclusions were reviewed and validated by the author to ensure the accuracy and integrity of the scientific reporting.