



## Highlights

The **SIPS 2018 - Sustainable Industrial Processing Summit & Exhibition** was held in Rio de Janeiro, Brazil from the 4<sup>th</sup> to the 7<sup>th</sup> of November 2018 at the Rio Othon Palace. Following the rich tradition of previous years, the summit covered three actors of sustainability: (1) Science, Technology, and Industry (2) Governance and Management, and (3) Education and Civil Society.

This time, the summit honored the 2018 STARS of sustainable science, technology, and innovation. In alphabetical order, they are:

- Ing. Paulo **Afonso Gomes**, B.Sc. - 2018 honoree with [Afonso International Symposium](#) on Advanced Sustainable Iron and Steel Making
- Prof. Christian **Amatore** - 2018 honoree with [Amatore International Symposium](#) on Electrochemistry for Sustainable Development
- Prof. Rasmus **Fehrmann** - 2018 honoree with [Fehrmann International Symposium](#) on Sustainable Molten Salt and Ionic Liquid Processing
- Prof. Athanasios **Mamalis** - 2018 honoree with [Mamalis International Symposium](#) on Advanced Manufacturing of Advanced Materials and Structures with Sustainable Industrial Applications
- Prof. Michael **Zehetbauer** - 2018 honoree with [Zehetbauer International Symposium](#) on Science of Intelligent and Sustainable Advanced Materials (SISAM)

The honorees cover areas that appear distinct, but are in reality all mutually related and share a common theme of sustainability.

In this context, in their honor, the summit incorporated numerous International Symposia covering the fields of: iron and steel making, electrochemistry, molten salt and ionic liquids, advanced materials, advanced manufacturing, advanced technologies, aluminum, batteries, bio-extraction, cement, coal, coatings, composites, ceramics, ecosystems, education, energy production, environment, ferro-alloys, mathematics, metallic systems, metals and alloys, minerals, mining, multiscale materials, nanomaterials, non-ferrous smelting and hydro/electrochemical processing, quasi-crystals, rare earth and platinum group metals, recycling, and rotary kiln operations. The topics within each symposia span across scientific, technological, environmental, health, legal, management, financial, policy, taxation, social, and pedagogy issues.

The summit had an Opening Event, three Summit Plenary sessions, and a Summit Gala that combined a record of 7 Nobel Prize Winners along with:

- CEOs/entrepreneurs of major industrial companies who reflected on the role of applied technology, management, and entrepreneurship;
- Academics and research institutes that reflected on the importance of research and education in creating pathways for innovation and change.
- Politicians and public figures who reflected on the role of governance and political frameworks

In other words, SIPS elevated its own bar toward higher levels of collaboration across multiple sectors and domains.



Copacabana Ballroom



View of Copacabana beach from the Rio Othon Palace

## SUMMIT PLENARIES

The three summit plenary sessions were held under the theme of Science and Sustainability.

### Summit Plenary I:

**Dr. Florian Kongoli**, FLOGEN Chairman and President of the Organizing Committee opened Summit Plenary I with a Thematic Opening Speech on sustainability framework and the role of science and technology.

**Prof. Sir Fraser Stoddart**, 2016 Nobel Prize Laureate in Chemistry, gave a lecture entitled *Serendipity Stokes Discovery: Disrupting Established Industries*, where he made the interesting case of the important role of serendipity in scientific discoveries



**Dr. Florian Kongoli**  
FLOGEN Chairman and SIPS President



**Prof. Sir Fraser Stoddart**  
2016 Nobel Laureate

**Prof. Sir Andre Geim**, 2010 Nobel Prize Laureate in Physics, presented a lecture entitled *Graphene: Magic of Flat Carbon* where he described the discovery of graphene and its numerous applications in science and technology today

**Dr. Alp Malazgirt**, CEO of YILMADEN Holding (Turkey), gave a presentation entitled *Digital Transformation in Mining: A Sustainable Path to Increasing Productivity, Protecting the Environment, and Developing the Society*, where he showed how his multinational company is achieving sustainable development aimed at zero waste using digital transformation among other tools.





**Prof. Sir Andre Geim**  
2010 Nobel Laureate



**Dr. Alp Malazgirt**  
CEO of YILMADEN Holding (Turkey)

**Prof. Donna Nelson**, 2016 President of the American Chemical Society, presented a very interesting county by county survey of longevity in the USA in the framework of sustainable development.



**Prof. Donna Nelson**  
2016 President of the American Chemical Society

## Summit Plenary II:

**Dr. Florian Kongoli** made the case why science and technology are the first in line among the three major actors of sustainability (Science & Technology, Governance & Management and Civil Society).

**Prof. Dan Shechtman**, 2011 Nobel Laureate in Chemistry, gave a lecture entitled *Intrapreneurship—Key to Success in Large and Small Organizations*, where he outlined the important role of intrapreneurship within large organizations in order to foster innovation and development.

**Prof. Kurt Wüthrich**, 2002 Nobel Laureate in Chemistry, gave a lecture entitled *How the Physics Principle of Nuclear Magnetic Resonance Improves the Quality of Daily Human Life*, where he outlined the history of nuclear magnetic resonance as well as his contribution in it. He also made the case of how this scientific discovery helps humanity.





**Prof. Dan Shechtman**  
2011 Nobel Laureate in Chemistry



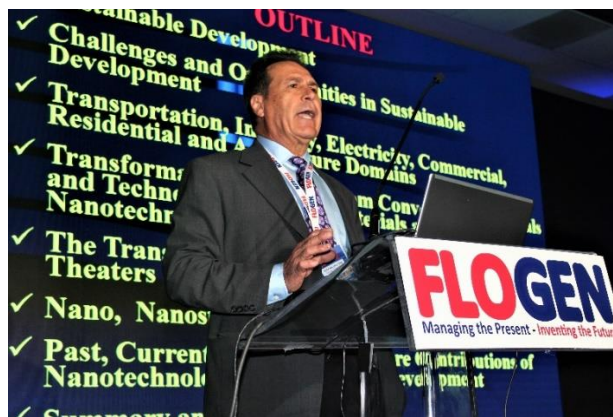
**Prof. Kurt Wüthrich**  
2002 Nobel Laureate in Chemistry

**Prof. Spomenka Kobe**, Josef Stefan Institute (Slovenia), presented a paper entitled *New Sustainable Processing of RE-based Magnetic Materials*, where she described the important role of magnetic materials and especially those that are based on rare earth that currently constitute precious and limited resources in the world.

**Prof. Fernand Marquis**, San Diego State University (USA), gave a presentation entitled, *Perspectives on the Role of Transformative Materials and Technologies in Energy, Environment and Sustainability*, where he provided important insights with a focus on key areas such as energy, environment, transportation, and sustainability.



**Prof. Spomenka Kobe**  
Josef Stefan Institute (Slovenia)



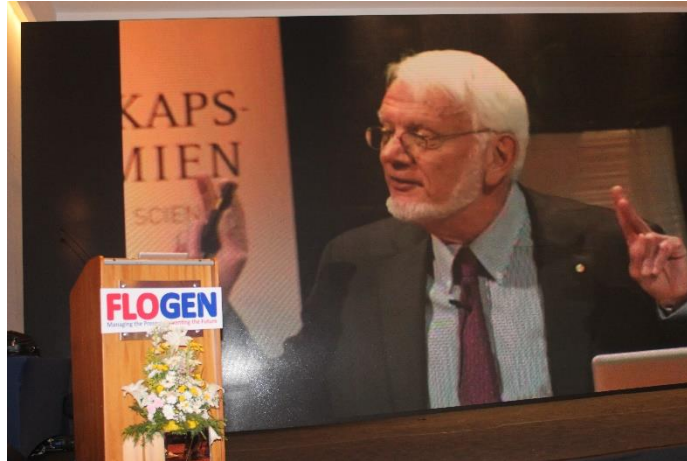
**Prof. Fernand Marquis**,  
San Diego State University (USA)

### Summit Plenary III:

**Dr. Florian Kongoli** described the disrupting role of science and technology in society, creating new challenges for other domains such as law and politics.

**Prof. Ferid Murad**, 1998 Nobel Laureate in Chemistry, provided a presentation on the history and discovery of the signaling effect of Nitric Oxide and detailed its multiple roles today in human health.

**Prof. Thomas Steitz**, 2009 Nobel Laureate in Chemistry, was represented in the summit with a video lecture he provided through his secretary before he unfortunately passed suddenly away, a short time before the start of the summit. The presentation was entitled *From the Structure and Function of Ribosome to New Antibiotics*.



**Prof. Thomas Steitz**  
2009 Nobel Laureate

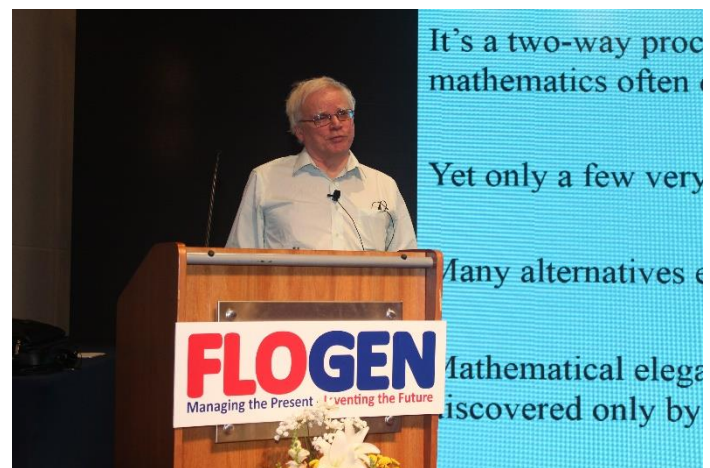
**Prof. Ada Yonath**, 2009 Nobel Laureate in Chemistry, provided a presentation on *Novel Microbiome Preserving and Eco-friendly Antibiotics*, where she outlined her work on ribosomes.

**Prof. Athanasios G. Mamalis**, PC-NAE, Demokritos National Center for Scientific Research (Greece), gave a presentation entitled *Advanced Manufacturing: Principles and Industrial Sustainable Applications*, where he described some trends and developments in advanced manufacturing and elaborated, with numerous examples, on the important role of manufacturing in sustainable development.

**Dr. Peter Rowlands**, University of Liverpool (United Kingdom), in his lecture entitled “*Unreasonable*” Effectiveness of *Mathematics in Physics*, made the case that the most successful use of mathematics in physics is not an application of an external system, but a natural growth that emerges with the fundamental concepts it describes.



**Prof. Athanasios Mamalis**  
PC-NAE, Demokritos National Center for Scientific Research (Greece)



**Dr. Peter Rowlands**  
University of Liverpool (United Kingdom)



## **AWARDS CEREMONY**

**Dr. Florian Kongoli**, FLOGEN Chairman and SIPS President opened the gala to all participants, STAR honorees and VIP guests.

Dr. João Ricardo, the Secretary of State of Rio de Janeiro, delivered an impressive welcome speech.



Dr. Florian Kongoli, FLOGEN Chairman and SIPS President



Dr. Florian Kongoli, Dr. João Ricardo (Secretary of State of Rio de Janeiro), and Kurt Wüthrich



Special address by Dr. João Ricardo



Dr. João Ricardo and Dr. Florian Kongoli



## Fray International Sustainability Award

During the Award Ceremony and Gala Dinner, several personalities were honored with the 2018 Fray International Sustainability Award and corresponding World Crystal Trophy, adding their name to the distinguished list of previous award winners. ([www.flogen.org/awards.php](http://www.flogen.org/awards.php)). The 2018 winners in each category were the following:

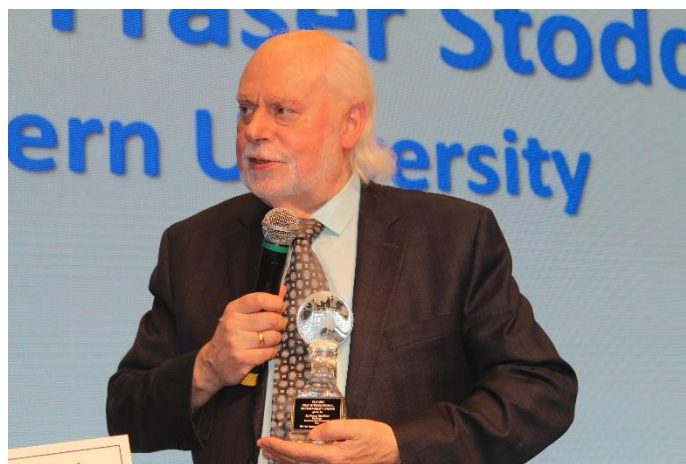
### Academia

*"For Leadership in developing new technologies that contribute to a global sustainable development in the environmental, economical, and social points of view"*

- Prof. Sir Fraser **Stoddart**, Northwestern University (USA), and 2016 Nobel Laureate in Chemistry
- Prof. Sir Andre **Geim**, University of Manchester (United Kingdom), and 2010 Nobel Laureate in Physics
- Prof. Kurt **Wüthrich**, ETH Zürich (Switzerland), University of California (USA), and 2002 Nobel Laureate in Chemistry
- Prof. Christian **Amatore**, CNRS & PSL and French Academy of Sciences (France)
- Prof. Rasmus **Fehrmann**, Technical University of Denmark – DTU (Denmark)
- Prof. Athanasios **Mamalis**, PC-NAE and NCSR Demokritos (Greece)
- Prof. Michael **Zehetbauer**, University of Vienna (Austria)



Prof. Sir Fraser Stoddart, 2016 Nobel Laureate in Chemistry with Prof. Donna Nelson, 2016 American Chemical Society President and past award winner



Prof. Sir Andre Geim, 2010 Nobel Laureate in Physics







Prof. Kurt Wüthrich, 2002 Nobel Laureate in Chemistry



Prof. Christian Amatore, CNRS & PSL and French Academy of Sciences (France)



Prof. Rasmus Fehrmann, Technical University of Denmark – DTU (Denmark)







Prof. Athanasios Mamalis, PC-NAE and NCSR Demokritos (Greece)



Prof. Michael Zehetbauer, University of Vienna (Austria)



## Corporations:

*"For Leadership in developing and applying new innovative business plans and operation technologies for a sustainable development of the company in the environmental, economical and social points of view"*

- Ing. Paulo **Afonso Gomes**, Consultant (Brazil)
- Ing. Romero **Corrêa**, Founder & Director of Grupo Vetorial (Brazil)



Ing. Paulo Afonso Gomes, Consultant (Brazil)







Ing. Romero Corrêa, Founder & Director of Grupo Vetorial (Brazil)

## Yildirim International Entrepreneurship Award

During the Award Ceremony and Gala Dinner, one selected personality was honored with the 2018 Yildirim International Entrepreneurship Award and corresponding **Crystal Skyscraper Trophy**, being the first of many distinguished award winners to come. ([www.flogen.org/awards.php](http://www.flogen.org/awards.php)).

The citation of this Award reads:

*"For innovative leadership in establishing, developing and/or growing, against all challenges, odds and risks, a sustainable business in the environmental, economical, and social points of view."*

The winner in this category was:

- Rodrigo **Valladares**, Founder & Director of Viena Siderúrgica S/A (Brazil)



Rodrigo Valladares (center), Founder & Director of Viena Siderúrgica S/A (Brazil) with Dr. Alp Malazgirt, YILMADEN Holding (Turkey), representing Robert Yildirim, CEO of Yildirim Group of Companies

## Stoddart International Scientific Award

During the Award Ceremony and Gala Dinner, one personality was honored with the 2018 Stoddart International Scientific Award and corresponding **Rising Cone Crystal Trophy**, being the first of many distinguished award winners to come. ([www.flogen.org/awards.php](http://www.flogen.org/awards.php)).

The citation of this Award reads:

*"For extraordinary scientific achievements within the framework of sustainable development."*

The winner in this category was:

- Dr. Florian **Spieckermann**, University of Leoben (Austria)



Dr. Florian Spieckermann, University of Leoben (Austria)

## Wüthrich International Young Star Award

During the Award Ceremony and Gala Dinner, one personality was honored with the 2018 Wüthrich International Young Star Award and corresponding **Shooting Star Crystal Trophy**, being the first of many distinguished award winners to come. ([www.flogen.org/awards.php](http://www.flogen.org/awards.php)).

The citation of this Award reads:

*"For outstanding scientific performance during the early career stages, within the framework of sustainable development."*

The winner in this category was:

- Dr. Alexander **Oleinick**, École Normale Supérieure (France)





Dr. Alexander Oleinick, École Normale Supérieure (France)



## Geim International Innovation Award

During the Award Ceremony and Gala Dinner, one personality was honored with the 2018 Geim International Innovation Award and corresponding Lighting Bulb Crystal Trophy, being the first of many distinguished award winners to come. ([www.flogen.org/awards.php](http://www.flogen.org/awards.php)).

The citation of this Award reads:

*"For extraordinary scientific innovation that enables a successful business and contributes to shaping a sustainable future."*

The winner in this category was:

- Dr. Haruhiko Inufasa, TIMA (Japan)



Dr. Haruhiko Inufasa, TIMA (Japan)





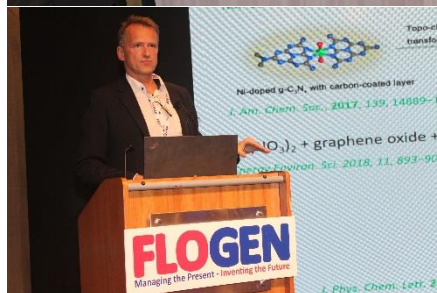
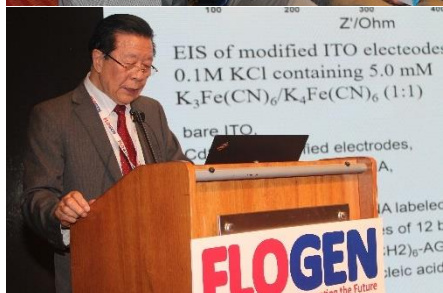
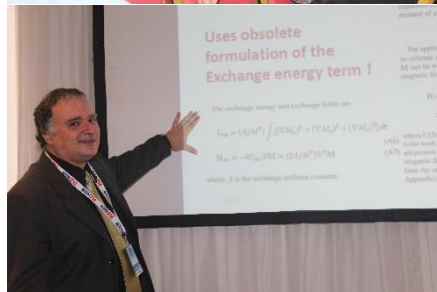
## THEMATIC SYMPOSIA

The summit had a strong number of scientific, technical and thematic symposia, with special emphasis on the sustainable developments of the 21st century. The overwhelming response from the international professional community was reflected in about 440 contributions received from authors and co-authors from about 60 countries throughout the world. The countries of principal authors given alphabetically were: Algeria, Argentina, Armenia, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, China, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, India, Iran, Israel, Italy, Japan, Kazakhstan, Kenya, Kosovo, Lithuania, Mexico, Nigeria, Norway, Pakistan, Peru, Poland, Romania, the Russian Federation, Saudi Arabia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, the United Kingdom, and the United States. The biggest contributor countries were Brazil, Austria, China, UK, Canada, Germany, Greece and Japan.

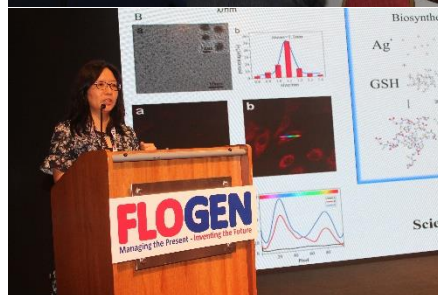
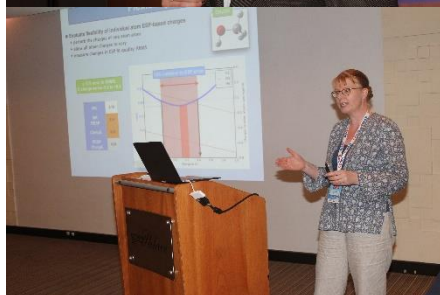
The papers were presented in **98 sessions** divided in the following thematic symposia:

- **Afonso International Symposium** on Advanced Sustainable **Iron and Steel Making** (6th Intl. Symp. on Advanced Sustainable Iron and Steel Making)
- **Amatore International Symposium** on **Electrochemistry** for Sustainable Development
- **Fehrmann International Symposium** on Sustainable **Molten Salt and Ionic Liquid Processing** (6th Intl. Symp. on Sustainable Molten Salt and Ionic Liquid Processing)
- **Mamalis International Symposium** on Advanced **Manufacturing** of Advanced Materials and Structures with Sustainable Industrial Applications
- **Zehetbauer International Symposium** on **SISAM** - Science of Intelligent and Sustainable Advanced Materials (4th Intl. Symp. on Science of Intelligent and Sustainable Advanced Materials (SISAM))
- 4th Intl. Symp. on **New and Advanced Materials and Technologies** for Energy, Environment and Sustainable Development
- 5th Intl. Symp. on Sustainable **Secondary Battery Manufacturing and Recycling**
- 5th Intl. Symp. on Sustainable Surface and Interface Engineering: **Coatings** for Extreme Environments
- 6th Intl. Symp. on **Composite, Ceramic and Nano Materials** Processing, Characterization and Applications
- Intl. Symp. on **Educational Strategies** for Achieving a Sustainable Future
- 5th Intl. Symp. on Sustainable **Energy Production**: Fossil; Renewables; Nuclear; Waste handling , processing, and storage for all energy production technologies; Energy conservation
- 7th Intl. Symp. on **Environmental**, Policy, Management , Health, Economic , Financial, Social Issues Related to Technology and Scientific Innovation
- 5th Intl. Symp. on Sustainable Production of **Ferro-alloys**
- 3rd Intl. Symp. on Sustainable **Mathematics** Applications
- 5th Intl. Symp. on Sustainable **Mineral Processing**
- 5th Intl. Symp. on Synthesis and Properties of **Nanomaterials** for Future Energy Demands
- 6th Intl. Symp. on Sustainable **Non-ferrous Smelting and Hydro/Electrochemical Processing**

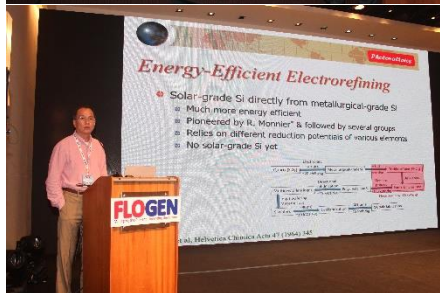
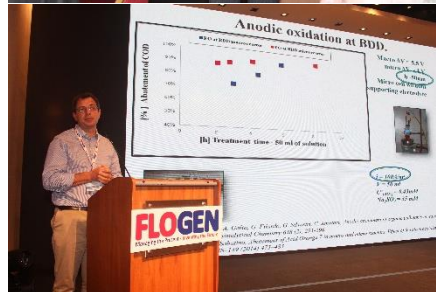
Some thematic symposia and their speakers are shown in the pictures below while the others are in the summit web site in the Post Symposium/Pictures tab.











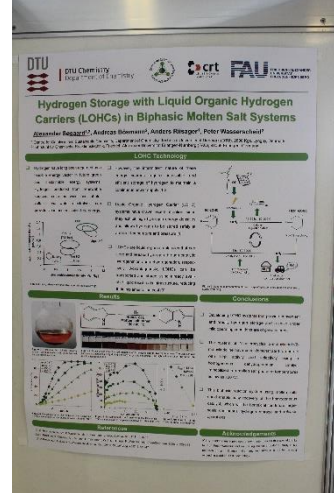
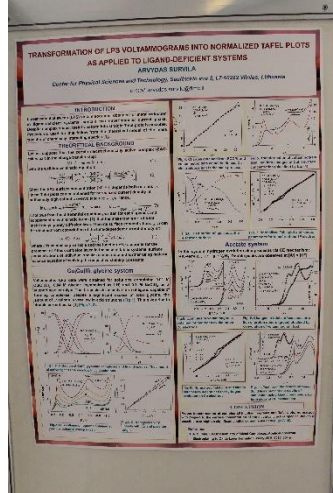
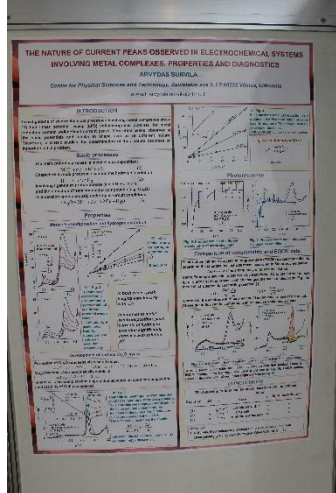
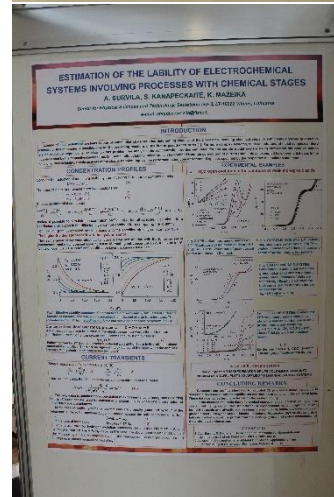
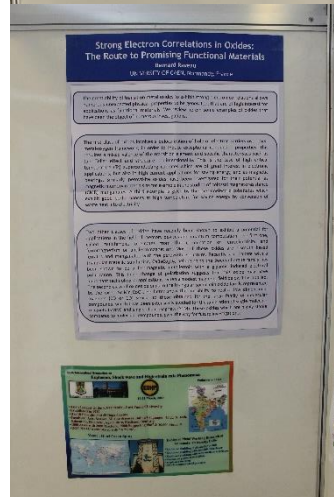
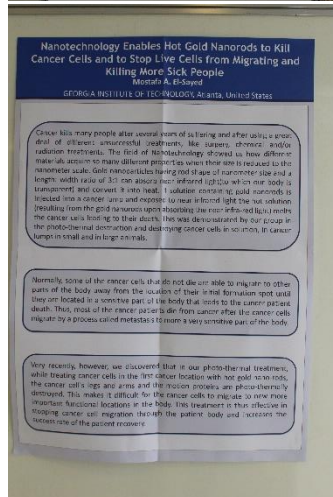
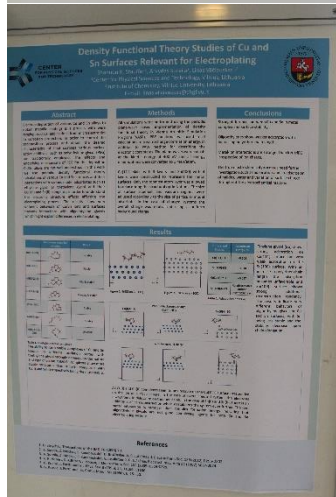
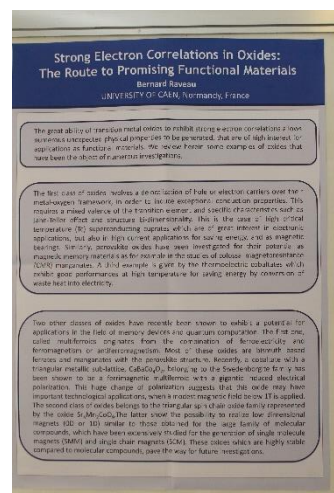
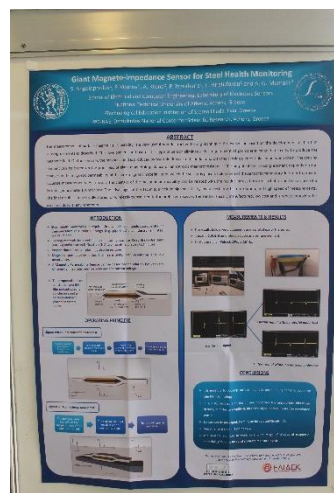
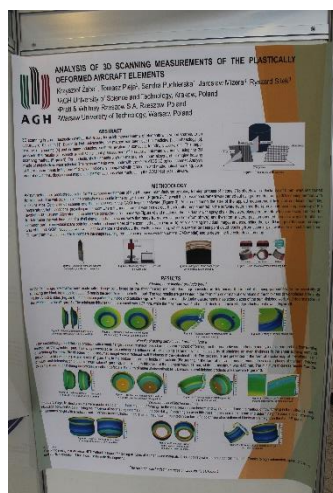
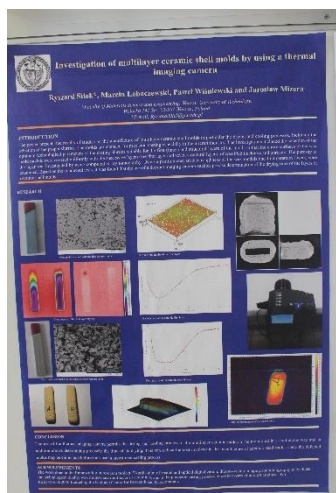




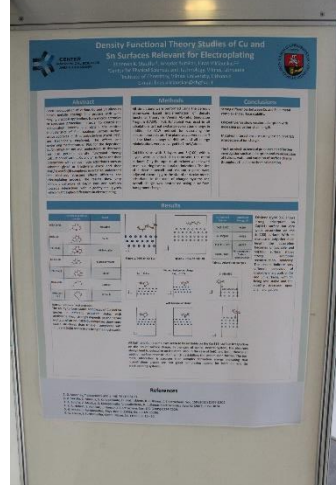
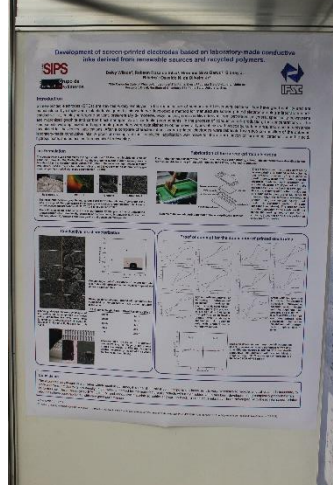
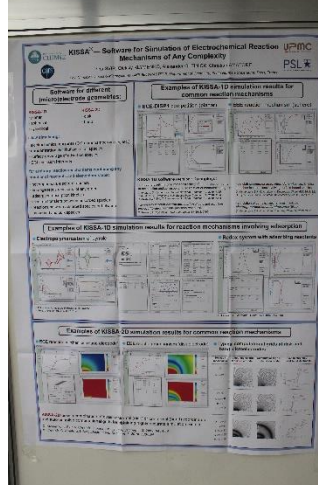
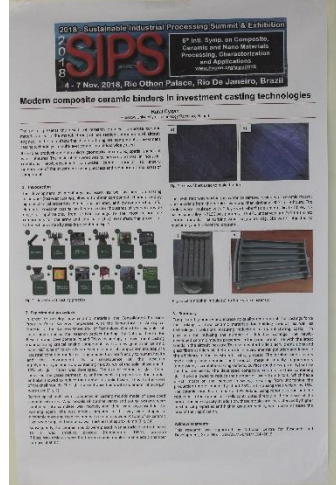
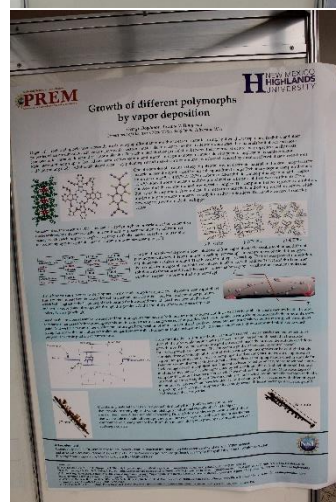
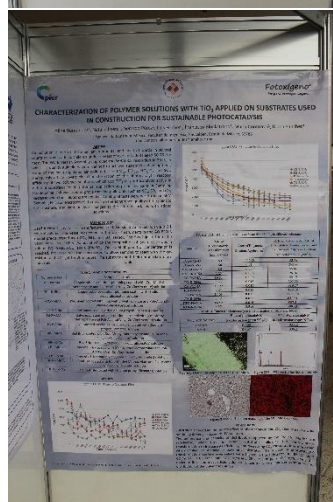
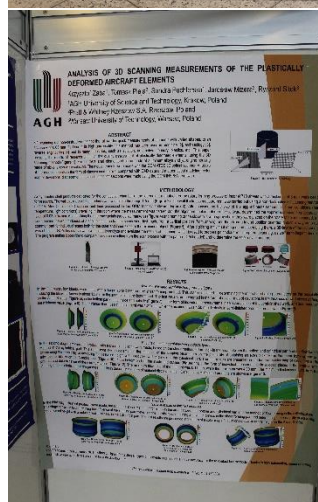
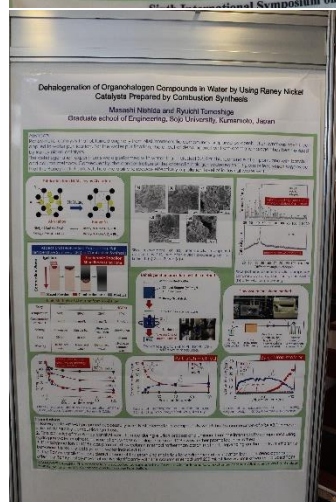
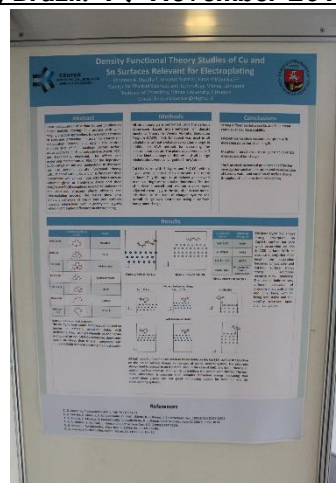
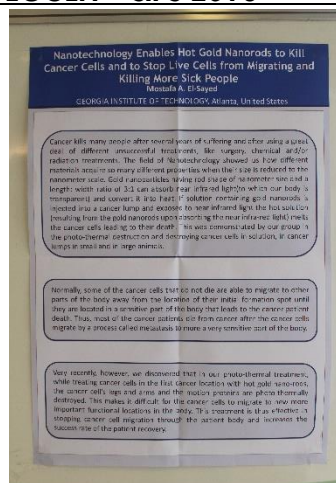


## POSTERS

Numerous poster presentations were given during the summit. Below are some of the posters featured:









## ROUND TABLES

Several round tables were organized in order to discuss different perspectives on the ideas presented during oral sessions. Some of the pictures taken during the summit are given below.



## AFTER SESSIONS

After technical sessions, the attendees enjoyed various activities in the magnificent areas of the Copacabana beach. Some of the pictures are given below.









## **SOCIAL PROGRAM**

The participants enjoyed several outstanding social functions:

### **Sunday Night Opening Event**

The Opening Event was held on Sunday evening on the famous Copacabana beachfront. This informal welcoming dinner involved a traditional Brazilian barbeque meal with cocktails and a modern Brazilian musical band.



Opening Event Dinner & Cocktail on Copacabana beach







SIPS 2018 guests at the Opening Event

**Monday's Dinner and Show** was held in the grand Copacabana Ballroom, and guests enjoyed a buffet dinner and cocktails, followed by a dazzling traditional Brazilian Samba dancing show exclusively organized for SIPS 2018 participants. Some of the pictures taken during the event are given below:







**Tuesday's Gala Dinner and Show** was held in the Copacabana Ballroom, and included an elegant full 4-course served dinner, and an International dancing show exclusively organized for SIPS 2018 participants. Some of the pictures taken during the event are given below:







## **PUBLICATIONS**

The final Submitted papers are published in the Summit Official Publication volumes which add up to previous similar publications (<http://www.flogen.org/books/index.php?page=2>).

### **2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 1: Afonso Intl. Symp. / Iron and Steel Making

Edited by: F. Kongoli, M.-C. Gomez-Marroquin, M. Contrucci, N. Lacerda, F. V. Cançado, M. de Souza, R. Valladaress

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-82-9 (CD)**

### **2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 2: Amatore Intl. Symp. / Electrochemistry for Sustainable Development

Edited by: F. Kongoli, H. Inufasa, M. G. Boutelle , R. Compton, J.-M. Dubois, F. Murad

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-84-3 (CD)**

### **2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 3: Fehrmann Intl. Symp. / Molten Salt and Ionic Liquid

Edited by: F. Kongoli, M. Haumann, P. Wasserscheid, T. Welton, M. Gaune-Escard, A. Angell, A. Riisager

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-86-7 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 4: Mamalis Intl. Symp. / Manufacturing of Advanced Materials

Edited by: F. Kongoli, A. G. Mamalis, K. Hokamoto

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-88-1 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 5: Zehetbauer Intl. Symp. / Science of Intelligent and Sustainable Advanced Materials (SISAM)

Edited by: F. Kongoli, S. Kobe, M. Calin, J.-M. Dubois, T. Turna

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-90-4 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 6: New and Advanced Materials and Technologies

Edited by: F. Kongoli, F. Marquis, P. Chen, T. Prikhna, N. Chikhradze

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-92-8 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 7: Non-ferrous, Mineral Processing and Environmental Protection

Edited by: F. Kongoli, Z. Wang, T. Okura, E. Souza, A. C. Silva

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-94-2 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 8: Composite, Ceramic, Nanomaterials and Mathematics

Edited by: F. Kongoli, M. de Campos

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-96-6 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

Volume 9: Energy Production and Secondary Battery

Edited by: F. Kongoli, H. Dodds, M. Mauntz, T. Turna, V. Kumar, K. Aifantis

Publisher: FLOGEN STARS OUTREACH

Publishing date: December 2018

**ISBN: 978-1-987820-98-0 (CD)**

**2018 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION**

9-volume Package

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## ATTENDEES' SATISFACTORY RATE

A poll among the attendees after the summit showed an overall satisfactory rate of 94%.

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4-7 November 2018  
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