2016 - Sustainable Industrial Processing Summit & Exhibition



Covering 3 Sustainability Pillars: (1)Science, Technology & Industrial Practice (2)Political and Social framework and (3)Education.

Incorporating numerous International Symposia related to: mineral*metals*material-mining*extraction*processing*manufacturing*recycling*waste treatment*energy-environmental/health* legal/management/financial*policy/social issues





DUBOIS INTERNATIONAL SYMPOSIUM



ØYE
INTERNATIONAL
SYMPOSIUM



SANTILLI INTERNATIONAL SYMPOSIUM

06 - 10 November 2016



STARKEY INTERNATIONAL SYMPOSIUM



YAGI INTERNATIONAL SYMPOSIUM



YANG
INTERNATIONAL
SYMPOSIUM

Sanya Marriott Yalong Bay Hainan-Island China

Dec 21, 2016

Highlights

The SIPS 2016 - Sustainable Industrial Processing Summit & Exhibition was held in Hainan Island, China from 6-9 November 2016 at the Yalong Bay Marriot Resort and SPA. Following the previous rich tradition, the summit covered 3 sustainability actors: (1) Science, Technology and Industrial Practice, (2) Political and Social Framework, and (3) Education.

This time, the summit honored the 2016 STARS of the closed cycle of materials sciences: from mining and mineral processing to metals extraction and processing and development of new materials. They are in alphabetic order:

- Prof. Jose D'Abreu 2016 honoree with <u>D'Abreu International Symposium</u> on Sustainable Iron and Steel Making
- Prof. Jean-Marie **Dubois** 2016 honoree with <u>Dubois International Symposium</u> on Sustainable Complex Metallic Systems
- Prof. Harald Arnljot Øye 2016 honoree with Øye International Symposium on Sustainable Ionic Liquid and Aluminum Extraction and Processing
- Prof. Ruggero Santilli 2016 honoree with <u>Santilli International Symposium</u> on Sustainable Mathematics Applications
- John Starkey 2016 honoree with Starkey International Symposium on Sustainable Mineral Processing
- Prof. Jun-Ichiro Yagi 2016 honoree with <u>Yagi International Symposium</u> on Sustainable Metal and Alloys Processing
- Prof. Wei Yang 2016 honoree with <u>Yang International Symposium</u> on Multiscale Material Mechanics and Multiphysics and Sustainable Applications

The honorees cover areas of materials sciences that look distinct but are actually related to each other and all have sustainability in common.

In this view, in their honor, the summit incorporated numerous International Symposia covering the field of minerals, metals and materials - dealing with mining, extraction, processing, manufacturing, recycling, waste treatment, and acting on environmental, health, legal, management, financial, policy, taxation, social and pedagogy issues.

The summit had an Opening Event, three Summit Plenary sessions, a Summit Gala that mixed together Nobel Prize Winners as well as:

- Politicians reflecting the importance of political framework
- CEOs of big industrial companies reflecting the role of applied technology and management
- Well known academics reflecting the role of education for an engaged society
- Research Institutes reflecting the role of base technologies.

23 technical symposia held in 11 parallel sessions encompassed more than 520 technical presentation from more than 80 countries around the world.



OPENING EVENT

The Opening event was held on Sunday Evening in the magnificent Beach Garden under magnificent lightning. It featured a short opening address from the President of the Organizing Committee Dr. Florian Kongoli presenting the Guest of Honor, Professor Dan Shechtman, 2011 Nobel Laureate in Chemistry and 7 STAR honorees of the summit: Professor D'Abreu, Prof. Dubois, Prof. Øye, Prof. Santilli, Ing. Starkey, Prof. Yagi and Prof. Wang.

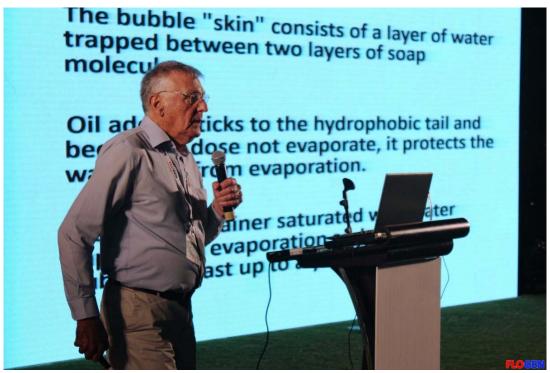


Preparations for the opening event in the beach garden



Dr. Kongoli introduces in the opening event Prof. D'Abreu, Prof. Shechtman, Prof. Yang, Prof. Yagi, Ing. Starkey, Prof. Santilli, Prof. Dubois and Prof. Øye

Professor Dan Shechtman, 2011 Nobel Laureate in Chemistry, followed with a very interesting presentation on the link between Science and Aesthetics.



Prof. Shechtman, 2011 Nobel Prize Laureate giving his special lecture of the evening



The audience at the opening event

SUMMIT PLENARIES

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

Summit Plenary I:

Dr. Florian Kongoli, FLOGEN chairman and President of the Organizing Committee opened The Summit Plenary I with a Thematic Short Speech on Sustainability and the Modified Central Paradigm of Materials Science and Engineering. Referring to his previously published articles he stressed the modification of the classical paradigm Processing->Structure->Property->Performance by adding the missing link to it: Processing->Structure->Property->Performance->Reutilization/Recyclability and giving new graphical presentations of the new modified paradigm.

Prof. Dan Shechtman, 2011 Nobel Prize Laureate in Chemistry, in his special plenary lecture entitled, Pathways to Innovative and Entrepreneurial Society, described in an inspiring way the importance of innovation and entrepreneurship in developing a sustainable society for both developing and developed countries.



Dr. Florian Kongoli FLOGEN Chairman



Prof. Dan Shechtman, 2011 Nobel Laureate, Technion Institute & Iowa State University.

Prof. Atsushi Muramatsu, Tohoku University, Japan made an excellent overview of nanoparticle technology concentrated on the recent development for sustainable applications.

Prof. Brajendra Mishra, Worcester Polytechnic Institute, USA, presented excellently the challenging subject of environmental and materials sustainability in extracting valuable materials from Bauxite residues.







Prof. Brajendra Mishra, Worcester Polytechnic Institute, USA

Prof. R. Dunin Borkowski, Forchungszentrum Jülich, Germany, overviewed the Electron Microscopy with all the recent development in the field concentrating in their application for sustainable development.



Prof. R. Dunin Borkowski, Forchungszentrum Jülich, Germany

Summit Plenary II:

Dr. Florian Kongoli, opened The Summit Plenary II with a short Thematic Address on sustainability and the strongly remedial role of science and engineering in achieving the goals of sustainability with effective and practical solutions.

Prof. Ruggero Santilli, CEO of Thunder Energies Corporation, USA, made a passionate presentation of his novel breakthrough technology on hyper combustion and hyper furnaces that burn coal efficiently without polluting the environment with CO₂ and thus achieving an important goal of sustainability.

Prof. Wei Yang, President of National Science Foundation of China gave an excellent overview of Research landscape in mainland China with all its impressive achievements and issues to be improved.



Prof. Ruggero Santilli,CEO, Thunder Energies Corporation, USA



Prof. Wei Yang,President, National Science Foundation of China

Dr. Tamer Turna, CEO, YILDIRIM Energy Investments, Turkey, made an impressive presentation on power plants flexibility and high efficiency and the specialized means of achieving them in the framework of sustainable development.

Prof. Michael Coey, School of Physics, Dublin, Ireland, made an intriguing presentation about the permanent magnets and their application for sustainable energy applications.



Dr. Tamer Turna,CEO, YILDIRIM Energy Investments, Turkey



Prof. Michael Coey, School of Physics, Dublin, Ireland

Summit Plenary III:

Dr. Florian Kongoli, opened The Summit Plenary II with a short Thematic Address on a special comparison between exact sciences and other disciplines in terms of the roles they play on sustainability.

Prof. Harald Øye, NTNU, Norway, gave an interesting presentation about the safety of the aluminum production industry and its evolution over the course of the years, stressing the fact that safety is an organic part of the social dimension of sustainability.

Prof. Vasant Kumar, Cambridge University, UK, addressed numerous issues in energy saving in the world and presented an impressive paradigm change in this field.



Prof. Harald Øye NTNU, Norway



Prof. Vasant Kumar Cambridge University, UK

Prof. José D'Abreu, PCU-Rio, Brasil, made an interesting overview of numerous iron-making technologies and analyzed the sustainable directions this industry needs to follow in the future.

Prof. Fernand Marquis, San Diego State University, USA, gave an impressive presentation on the role of New Advanced Materials on sustainable development.



Prof. José D'Abreu PCU-Rio, Brasil



Prof. Fernand MarquisSan Diego State University, USA

AWARDS CEREMONY

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





Dr. Florian Kongoli, FLOGEN Chairman

Fray International Sustainability Award

During the Award Ceremony and Gala Dinner several personalities/entities were honored with the 2016 Fray International Sustainability Award and its respective World Crystal Trophy adding their name in the previous list of distinguished personalities that won this award (www.flogen.org/awards.php).

The 2016 winners in their respective categories were the following:

Academia:

- Prof. José D'Abreu, PCU-Rio, Brasil
- Prof. Jean-Marie Dubois, CNRS, France and Jožef Stefan Institute, Slovenia
- Prof. Harald Arnljot Øye, NTNU, Norway
- Prof. Jun-Ichiro Yagi, Tohoku University, Japan

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





Prof. José D'Abreu, PCU-Rio, Brasil





Prof. Jean-Marie **Dubois**, CNRS, France and Jožef Stefan Institute, Slovenia





Prof. Harald Arnljot Øye, NTNU, Norway





Prof. Jun-Ichiro Yagi, Tohoku University, Japan

Corporations:

- Prof. Ruggero Santilli, CEO, Thunder Energies Corporation, USA
- John Starkey, Starkey & Associates Inc., Canada

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





Prof. Ruggero Santilli, CEO, Thunder Energies Corporation, USA





John Starkey, Starkey & Associates Inc., Canada

Politics:

Prof. Wei Yang, President, National Science Foundation of China

"For Leadership in developing new advanced public policy frameworks related to the efficiency of mineral and metal resources for a global sustainable development"





Prof. Wei Yang, President, National Science Foundation China



A group photo with some FRAY International Sustainability Award Winners

SIPS SCIENTIFIC AWARDS

SIPS Scientific Awards were given by **Santilli Foundation** to scientists that have achieved notable contribution in mathematical sciences.

The scientists who were honored with this award during SIPS 2016 were the following:



Simone **Beghella-Bartoli**, Thunder Energies Corporation, Italy



Tuladhar Bhadra **Man**, Kathmandu University, Nepal



Anil A. **Bhalekar**, R.T.M. Nagpur University, India



Svetlin Georgiev, Sorbonne University, France



Arun **Muktibodh**, Mohota College of Science, India



Stein **Johansen**, Norwegian University of Science and Technology, Norway



Thomas **Vougiouklis**, Democritus University of Thrace, Greece



Erik Trell, Linkoping University, Sweden



A group photo with some SIPS Scientific Award Winners

THEMATIC SYMPOSIA

The summit had a strong number of 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 521 contributions received from authors and co-authors from 80 countries all over the world, which made this summit a record in its class. The countries of principal authors given alphabetically were: Algeria, Armenia, Australia, Austria, Brazil, Canada, China, Czech Republic, Finland, France, Georgia, Germany, Great Britain, Greece, Hong Kong, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, South Korea, Kosovo, Macedonia, Madagascar, Malaysia, Mexico, Nepal, Netherlands, Nigeria, Norway, Peru, Poland, Romania, Russian Federation, Rwanda, Saudi Arabia, Serbia, Singapore, Slovenia, South Africa, Spain, Sweden, Taiwan, Turkey, Ukraine, United Kingdom, United States. The biggest contributor countries were China, Russia, Japan, India, Brazil and United States.

The papers were presented in **102 sessions** divided in the following thematic symposia:

- D'Abreu International Symposium (4th Intl. Symp. on Advanced Sustainable Iron and Steel Making)
- Dubois International Symposium (Intl Symp. on Sustainable Complex Metallic Systems)
- Øye International Symposium (Intl Symp. on Sustainable Ionic Liquid and Aluminum Extraction and Processing)
- Santilli International Symposium (Intl. Symp. on Sustainable Mathematics Applications)
- Starkey International Symposium (3rd Intl. Symp. on Sustainable Mineral Processing: Principles, Technologies and Industrial Practice)
- Yagi International Symposium (2nd Intl. Symp. on Sustainable Metals & Alloys Processing)
- Yang International Symposium (3rd Intl. symp. on Multiscale Material Mechanics and Multiphysics and Sustainable Applications)
- 2nd Intl. Symp. on Advanced Materials and Technologies for Sustainable Energy and the Environment(AMTSEE)
- 2nd Intl. Symp. on Multifunctional and Smart Materials, Systems and Structures for Sustainability (MSMSSS)
- 3rd Intl. Symp. on Sustainable Secondary Battery Manufacturing and Recycling
- 3rd Intl. Symp. on Sustainable Base-metal Bio-extraction
- 3rd Intl. Symp. on Sustainable Cement Production
- Intl. Symp. World Forum on Sustainable Coal Combustion and Processing
- 3rd Intl. Symp. on Sustainable Surface and Interface Engineering: Coatings for Extreme Environments
- 4th Intl. Symp. on Composite, Ceramic and Nano Materials Processing, Characterization and Applications
- 3rd Intl. Symp. on Sustainable Energy Production: Gas/Oil/Shale; Coal; Nuclear; Waste/Bioprocessing and renewables: wind/waves
- 5th Intl. Symp. on Environmental, Health, Policy, Legal, Management and Social Issues Related to Metals, Materials and Mineral Processing
- 3rd Intl. Symp. on Sustainable Production of Ferro-alloys
- 3rd Intl. Symp. on Sustainable Mining Operations
- 4th Intl. Symp. on Sustainable Molten Salt and Ionic Liquid Processing
- 3rd Intl. Symp. on Synthesis and Properties of Nanomaterials for Future Energy Demands
- 4th Intl. Symp. on Sustainable Non-ferrous Smelting and Hydro/Electrochemical Processing
- 2nd Intl. Symp. on Physics of Surfaces and Interfaces, from Fundamentals to Sustainable Applications
- 4th Intl. Symp. on Quasi-crystals, Metallic Alloys, Composites, Ceramics and Nano Materials

- 3rd Intl. Symp. on Rare Earth and Platinum Group Metals: Managing and Processing
- 4th Intl. Symp. on Sustainable Materials Recycling Processes and Products
- Intl. Symp. on Rotary Kiln Operations for Sustainable Products

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





























POSTERS

Numerous poster presentations were given during the summit. The pictures below show the poster area.





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ROUND TABLES

Several round tables were organized in order to discuss in a different perspectives the ideas presented during oral sessions.



Starkey/Mineral Processing Round table



Santilli/Mathematics Round Table

AFTER SESSIONS



SOCIAL PROGRAM

The participants enjoyed several outstanding social functions:

Sunday Opening Event was held in the magnificent garden beach and included a VIP presentation from Prof. Dan Shechtman, 2011 Nobel Laureate in chemistry, a buffet dinner and spectacular dancing shows organized exclusively for SIPS 2016 participants.



Monday Dinner and Show was held in the grand ballroom and included a generous buffet dinner and spectacular dancing shows organized exclusively for SIPS 2016 participants.



Tuesday Gala Cocktail, Dinner and Show was held in grand ballroom and included a generous a 3 course Chinese fine dinner and spectacular dancing shows organized exclusively for SIPS 2016 participants.













Wednesday Cocktail, Dinner and Show, was held in pool-side garden and included a generous buffet dinner and spectacular dancing shows organized exclusively for SIPS 2016 participants.



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?spage=2).

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 1: D'Abreu Intl. Symp. / Iron and Steel Making

Edited by: F. Kongoli, J. H. Noldin, C. Takano, F. Lins, M. C. Gomez Marroquin, M. Contrucci

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-37-9 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 2: Dubois Intl. Symp. / Complex Metallic Systems

Edited by: F. Kongoli, S. Kobe, M. Calin, C. Dong

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-38-6 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 3: Øye Intl. Symp. / Ionic Liquid and Aluminum

Edited by: F. Kongoli, N. Feng, P. Polyakov, M. Gaune-Escard

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-40-9 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

<u>Volume 4</u>: Santilli Intl. Symp. / Mathematics Applications Edited by: F. Kongoli, G. Gaines, S. Georgiev, A. Bhalekar

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-42-3 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 5: Starkey Intl. Symp. / Mineral Processing

Edited by: F. Kongoli, P. Kumar, A. Senchenko, B. Klein, A.C. Silva, C. Sun, W. Mingan

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-44-7 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 6: Yagi Intl. Symp. / Metals & Alloys Processing

Edited by: F. Kongoli, T. Akiyama, H. Nogami, K. Saito, A. Fujibayashi

Publisher: FLOGEN STARS OUTREACH

FLOGEN - SIPS 2016

Publishing date: December 2016 ISBN: 978-1-987820-46-1 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 7: Yang Intl. Symp. / Multiscale Material Mechanics

Edited by: F. Kongoli, E. Aifantis, H. Wang, T. Zhu

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-48-5 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 8: Non-ferrous, Rotary Kiln, Ferro-alloys, Rare Earth, Coal

Edited by: F. Kongoli, G. Xueyi, V. Shumskiy, P. Kozlov, C. Capiglia, A.C. Silva, T. Turna

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-50-8 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

Volume 9: Molten Salts and Ionic Liquids, Energy Production

Edited by: F. Kongoli, M. Gaune-Escard, T. Turna, M. Mauntz, H.L. Dodds

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-52-2 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

<u>Volume 10</u>: Battery, Recycling, Environmental, Mining Edited by: F. Kongoli, V. Kumar, K. Aifantis, F. Pagnanelli

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-54-6 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

<u>Volume 11</u>: Physics, Advanced/Multifunctional Materials, Composite, Quasi-crystals, Coating

Edited by: F. Kongoli, F. Marquis, H. Xia, P. Masset, P. Rokicki, L. Lu

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-56-0 (CD)

2016 SUSTAINABLE INDUSTRIAL PROCESSING SUMMIT AND EXHIBITION

11-volume Package

Editor-in-Chief Florian Kongoli

Publisher: FLOGEN STARS OUTREACH Publishing date: December 2016 ISBN: 978-1-987820-58-4 (CD)

SPONSORS

SIPS 2016 was the 2016 flagship event of FLOGEN Star OutreachTM (<u>www.flogen.org</u>), a non-profitable international organization dedicated to bringing to the world-wide society a level of acknowledgement of various science, technology and engineering personalities or entities for achievements related to global sustainable development. Financial sponsorship was provided by **FLOGEN Technologies Inc., GRAND NANCY, DOMEL, TOMS,** etc.

Other sponsors included 75 Professional Organizations; Media; Academic Institutions, Journals and Publishers. The complete list of financial supporters and organizational sponsors are given at: http://www.flogen.org/sips2016/?gid=31

ATTENDEES' SATISFACTORY RATE

A poll among the attendees after the symposium showed an overall satisfactory rate of 97%.

Dr. Florian Kongoli
President
Sustainable Industrial Processing Summit
3 - 6 November 2016
Chairman
FLOGEN STARS OUTREACH
www.flogen.org
fkongoli@flogen.org



APPENDIX: SOME WRITTEN IMPRESSIONS

Congratulations on your very nice "2016 – Sustainable Industrial Processing Summit." It was a Great Success!

Prof. Tateo Usui

Osaka University, Japan

Thank you for a magnificent well organized and successful summit!

Prof. Ruggero Maria Santilli

CEO, Thunder Energies Corporation, USA

It was really nice talking with you in your wonderful conference. I enjoyed my stay.

Dr. Koji Saito

NSSMC, Japan

SIPS-2016 was really a great success and a very happy experience for me! Congratulations to you and FLOGEN personnel who brought together so many specialists that gave me the opportunity to meet old friends and to make new ones!... Again, thank you so much for the Symposium in my honor and the opportunity to know the beautiful Sanya.

Prof. José C. D'Abreu

PUC-Rio, Brasil

Thank you very much for your kind consideration to have held my symposium in SIPS2016, I had a good time with you and my friends, coworkers and students at the symposium.

Prof. Jun-ichiro YAGI

Tohoku University, Japan

Thank you for a highly inspiring and well organized conference!

Prof. Stein E. Johansen

Norwegian University of Science and Technology, Norway

Please accept my Congratulations on staging SIPS 2016 with a grand success at Sanya. I hope you will continue such activities in future too.

Prof. Anil Bhalekar

R.T.M. Nagpur University, India

Once more, the Dubois Symposium at SIPS 2016 was a great success, from both human and scientific points of view.

Prof. Jean-Marie Dubois

Institut Jean Lamour, France & Jožef Stefan Institute, Slovenia

The symposium was superb and we enjoyed it very much both from scientific and human point of view!

Ao. Univ. Prof. i. R. Dr. Michael J. Zehetbauer

University of Vienna, Austria

I and my daughter really enjoyed the event and we are looking forward to see you again.

Prof. Thomas Vougiouklis

Democritus University of Thrace, Greece

Thank you again for the invitation to Sustainable Industrial Processing Summit 2016. I enjoyed it very much.

Prof. Harald Arnljot Øye

NTNU, Norway

Thanks for an interesting meeting in Hainan!

Prof J. M. D. Coey FRS

School of Physics, Ireland

I very much enjoyed the symposium and was impressed by your and your team members' passion and efforts.

John (Xuefeng) Dong

BlueScope Steel Ltd, Port Kembla, Australia

Congratulations for the successful meeting. My teacher Yu Li attended the meeting and shared with me its wonderful content!

Dejian Pei

University of Science & Technology Beijing