

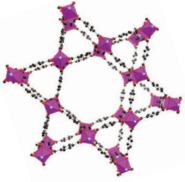
150

Y E A R S

of Beautiful
Structures
& Defects

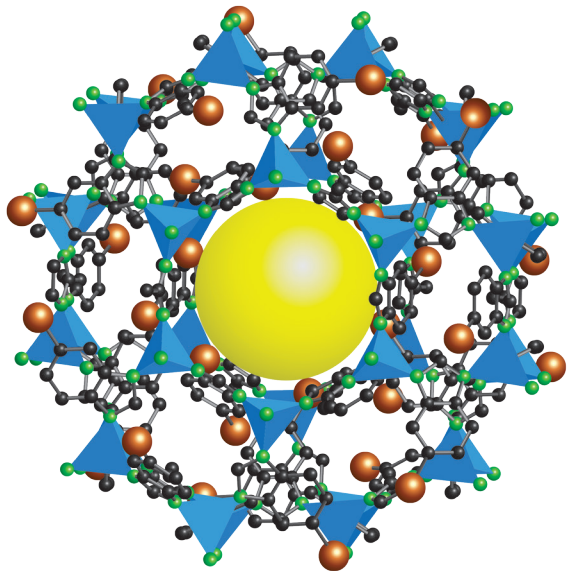
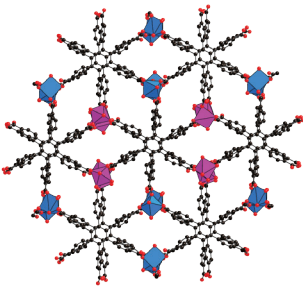
UCB-MANAR
SYMPOSIUM

PROGRAM



WELCOME

LETTER



On behalf of the Center for Molecular and NanoArchitecture (MANAR) and as Co-Chairman of this symposium, it is my great pleasure to welcome you to “150 Years of Beautiful Structures and Defects.” This event is truly unique for Vietnam as it brings together prominent scientists from around the world in order to celebrate the immense contributions of Professors Michael O’Keeffe and Osamu Terasaki as well as to celebrate the 20th anniversary of Vietnam National University - Ho Chi Minh City.

The host organization, Vietnam National University - Ho Chi Minh City (VNU-HCM), is the largest and most distinguished university in Vietnam. Throughout its history, VNU-HCM has actively promoted academic research collaborations both within the Vietnamese scientific community as well as internationally. In line with VNU-HCM’s spirit and objectives, MANAR has partnered with Professor Omar M. Yaghi (University of California, Berkeley and the Center for Global Science at UC Berkeley) to bring you this symposium. We believe that this is a valuable opportunity for you to learn more about advanced materials research and to interact with highly regarded professors.

Indeed, it goes without saying that we could not be here without Professors Osamu Terasaki and Michael O’Keeffe. Their highly influential body of work has not only afforded major advancements in the fields of materials science and inorganic chemistry, but has also served as inspiration for several generations of scholars around the world.

We hope that you enjoy this symposium as well as your time in Ho Chi Minh City. I would like to extend my sincerest appreciation to representatives of VNU-HCM, Vietnam Ministry of Science and Technology (MoST), NAFOSTED, and MANAR members. Furthermore, I wish to thank Professor Omar M. Yaghi, the organizing committee, and our sponsors for making this event possible.

A handwritten signature in black ink, appearing to read 'Dzung', with a long horizontal line extending from the end of the signature.

Dzung Hoang, Ph.D.
Co-Executive Director, Center for Molecular and NanoArchitecture
Co-Chairman of Symposium

SYMPOSIUM

OBJECTIVES

150 Years of Beautiful Structures and Defects symposium on metal-organic frameworks (MOFs) and similarly related materials is organized to honor Professors Michael O’Keeffe and Osamu Terasaki’s immense contributions to the scientific community’s understanding of chemical structure and defects. The symposium seeks to strengthen the relationship between Vietnamese scientists and international colleagues and provides a forum for the discussion of recent advances in materials science and inorganic chemistry research.

Through this symposium, we aim to promote the exchange of information through presentations by distinguished international researchers, engagement of Vietnamese scientists with the international community, foster research collaborations in materials science and inorganic chemistry, and increase international awareness about the outstanding scientific research being performed in Vietnam. By accomplishing these goals, we hope to develop and advance the global science network we seek to be a part of.

Topics covered during this two-day event include:

- ♦ **Reticular chemistry and the rational design of extended frameworks**
- ♦ **Metal-organic frameworks and related porous, crystalline materials: theory, synthesis, novel concepts, and future developments**
- ♦ **Crystallography and structural inorganic chemistry**
- ♦ **Electron microscopy as a structural characterization tool**
- ♦ **Gas adsorption, separation, and storage**
- ♦ **Clean energy technology, including energy conversion**

SCIENTIFIC PROGRAM

Saturday, November 15th

Morning Session | 09:00 - 12:00 | Chairs: Anh Phan, Kyle E. Cordova

- 09:00 - 09:30 **Introduction**
VNU's Vice President Dat T. Huynh, Prof. Hieu Van Nguyen,
and Prof. Omar M. Yaghi
- 09:30 - 10:05 **Sven Lidin**
 Cu_3In_2 - When Atomicity Breaks Down
- 10:05 - 10:40 **Sumio Iijima**
The State-of-the-Art of TEM Characterization of
Nano-Materials such as Carbon Nanotubes, Graphene,
and Al-Hydroxide
- 10:40 - 11:15 **Omar M. Yaghi**
Reticular Chemistry and the Design of New Materials
- 11:15 - 11:35 **Thanh Truong**
MOFs with First-Row Transition-Metal Clusters
in Organic Methodology Development
- 11:35 - 13:30 **Lunch**

Afternoon session | 13:30 - 17:30 | Chairs: Anh Phan, Thanh Truong

- 13:30 - 14:05 **Susumu Kitagawa**
Softness, Collectiveness, and Electric Flexibility
of PCPs/MOFs
- 14:05 - 14:40 **Jeffrey R. Long**
Carbon Dioxide Capture and Hydrocarbon
Separations in Metal-Organic Frameworks

14:40 - 15:15	Lars Öhrström Rules of Beauty or Beautiful Rules? Topology, Nomenclature, and Why We Need Them
15:15 - 15:50	Break and Poster Session Foyer outside of Auditorium
15:50 - 16:25	Davide Proserpio Entanglement in 2-Periodic Coordination Networks
16:25 - 17:00	Michael O’Keeffe The Structure of Crystal Structures
17:00 - 17:35	Haw Yang Direct 3D Visualization of Nanoparticle Cellular Uptake

Sunday, November 16th

Morning Session | 09:00 – 12:00 | Chairs: Cattien Nguyen, Giang Dao

09:00 - 09:35	Stephen Hyde Understanding Some MOFs via Two-Dimensional Weavings
09:35 - 10:10	Michael Anderson How Does Your Nanoporous Crystal Grow?
10:10 - 10:45	Kyung Byung Yoon A Novel Microporous Vanadosilicate with Hexadeca Coordinated Cs ⁺ ions as a Highly Effective Cs ⁺ Remover
10:45 - 11:20	Motoko Kotani Structural Understanding of Materials - Collaboration Between Mathematics and Materials Science
11:20 - 13:00	Lunch Poster Sessions Foyer Outside of Auditorium

- 13:00 - 13:35 **Shilun Qiu**
Crystallization of Zeolites and MOFs
- 13:35 - 14:10 **Kazuyuki Kuroda**
Role of Organic Groups for the Creation of Structurally
Controlled Siloxane-Based Nanomaterials
- 14:10 - 14:45 **An-Pang Tsai**
Quasicrystal: The State-of-the-Art
- 14:45 - 15:25 **Break and Poster Sessions**
Foyer Outside of Auditorium
- 15:25 - 16:00 **Mohamed Eddaoudi**
Metal Organic Frameworks: From Design Strategies
to Applications
- 16:00 - 16:35 **Osamu Terasaki**
Memoirs on My Research Itinerant from Magnéli
Phases to MOF, ZIF, COF
- 16:35 - 17:10 **Christopher J. Chang**
Chemistry and Materials Biology Approaches
to Catalyzing Artificial Photosynthesis



VIETNAM NATIONAL UNIVERSITY

HO CHI MINH CITY

Vietnam National University - Ho Chi Minh City (VNU-HCM) is the largest and most distinguished multi-disciplinary university in Vietnam. It was established in January of 1995 by merging premier universities in Ho Chi Minh City into one entity. Currently, VNU-HCM has 50,000 full-time undergraduate and graduate students actively engaged in 120 undergraduate, 90 masters, and 90 Ph.D. academic programs. VNU-HCM has international education accords with over 120 universities from 20 countries allowing students and scholars to participate in exchange programs.

The university's mission is to become Vietnam's premier institution of higher education and to pursue academic excellence in its teaching and research to serve the local, national, and international communities. To ensure the university maintains this vision, VNU-HCM upholds the highest standards of intellectual inquiry and academic achievement. It is constantly expanding its wide range of academic programs and upgrading its facilities.

VNU-HCM provides an education system with self-responsibility. It possesses institutional autonomy and the integrity necessary to uphold the highest standards of intellectual inquiry and academic freedom. Its innovative academic and research programs allow students and staff to enjoy an environment conducive to education and creativity. The staff, undergraduates, graduate students, and researchers are truly a community of scholars.

VNU-HCM maximizes each student's potential through education programs, training resources, and innovative mentoring. These graduates are equipped for success in their post-scholarly endeavors. They are well qualified and capable to benefit the development not only in Vietnam, but also the global community and economy.

MICHAEL O'KEEFFE



Professor O'Keeffe's long and illustrious career began at the University of Bristol where he received his Ph.D. He worked briefly at Indiana University before starting his tenure at Arizona State University, USA. He is currently Emeritus Regents' Professor and Research Professor at Arizona State University.

He has over 300 publications, including 3 books, 20 papers in *Nature*, and 13 in *Science*. Prof. O'Keeffe has 13 publications with more than 1,000 citations (with a Hirsch index $h_p = 88$). He is one of the 100 highest impact chemists from 2000-2010, 3rd in impact (citations per paper), and 12th in total citations.

O’Keeffe’s research is mainly concerned with the atomic and electronic structure and properties of crystalline inorganic solids. Highlights of his early work include the discovery and interpretation of inverse isotope effect in hydrogen diffusion in metals; the first to identify anion-conducting solid electrolytes, termed “superionic conductors”; the first identification and structure determination of a new mineral (takéuchiite) entirely by electron microscopy; recognition (with S. Anderson) of the importance of cylinder (rod) packings in crystal chemistry; recognition (with B. G. Hyde) of the role of non-bonded interactions in crystal chemistry; general theory of bond lengths and atom size; proposals and evaluations (with O. F. Sankey) for new structures of carbon fullerenes; and extensive studies (with B. G. Hyde) in the role of geometry of periodic patterns in crystal chemistry.

His recent work has particularly focused on the geometry of periodic frameworks and its importance in crystal chemistry. He, with Professor O. M. Yaghi, executed the design, synthesis and characterization of periodic metal-organic frameworks that proved remarkably robust and porous. Papers on this subject have won the Newcomb Cleveland Prize of the American Association for the Advancement of Science for the best paper in *Science*. Through collaborations with O. Delgado-Friedrichs, he has developed the theory of periodic structures and methods for enumerating and characterizing them. Through further collaborations with both Yaghi and Delgado-Friedrichs, he has developed the systematics of design and synthesis of metal-organic and related framework materials. Finally, he has developed design and synthesis strategies for making oxide and sulfide materials with giant pores. His immediate goals are to design possible topologies to evaluate which of these would serve as the basis for materials of interesting and useful properties (e.g. gas adsorption and catalytic properties), and to discover routes for their synthetic realization.

OSAMU TERASAKI



Osamu Terasaki began his career at Tohoku University, Japan, where he obtained his Ph.D. and later served as a faculty member in the Department of Physics for more than 36 years. He has been a guest professor at Lund University, Sweden; Jilin University, China; Shanghai Jiao Tong University, China; Waseda University, Japan, among others. He was the Research Director of Core Research for Evolutional Science and Technology, Japan Science and Technology Corporation. Currently, he is a Professor in the Department of Materials and Environmental Chemistry at Stockholm University, Sweden; Visiting Professor at UC Berkeley, USA; and Invited Guest Professor, KAIST, Korea.

Based on his research of mesoporous materials over the past decade, his work ranks as 6th by total citations, by number of papers, and by cites per paper, with 64 papers cited a total of 2,910 times. Three of his papers appear on the list of the 20 most-cited papers in this topic over the past decade by ScienceWatch.

Terasaki has been involved in numerous international commissions. Presently, he is an Editorial Board Member of *Microporous and Mesoporous Materials*; and an Editorial Advisory Board Member of *Small* (Wiley-VCH) and of *Current Solid State Chem*. Previously he was a Council Member of the International Zeolite Association; Council Member of the International Mesoporous Society and Structure Member of IZA.

It comes as no surprise that Terasaki has accumulated a multitude of awards throughout his career. He was awarded the Y. S. Kuno Prize, the Honor Prize of Tohoku University (1964); First Place, Int. Metallographic Exhibit in the electron microscopy transmission class, International Metallographic Society and American Society for Metals (1982); the Seto Award, Award of Japanese Society of Electron Microscopy (1993); the Daiwa Adrian Price, Daiwa Anglo-Japanese Foundation, London (1996); the Best Paper Award, Japanese Society of Electron Microscopy (2001); the Donald W. Breck Award, Alexander von Humboldt Foundation (2008); and made The Honorary Member of Scandinavian Electron Microscopy Society (2010).

SPEAKER

BIOGRAPHIES



Michael Anderson

University of Manchester, England

Professor Michael Anderson has substantial experience over 20 years in the study of nanoporous materials, publishing over 170 papers. He received the Royal Society of Chemistry Barrer Award in 1993 for distinguished work on zeolites, was recently Chairman of the British Zeolite Association, and is currently Secretary of the International Zeolite Association. Furthermore, he is the Director of the Center for Nanoporous Materials and a fellow of the Royal Society of Chemistry. His specific research interests include: experimental and theoretical NMR studies of heterogeneous microporous catalysts, atomic force microscopy and electron microscopy studies of crystallization mechanisms, and the synthesis and applications of novel materials. Research webpage: <http://www.cnm.manchester.ac.uk/index.html>.



Christopher J. Chang

University of California, Berkeley, USA

Professor Christopher J. Chang is a Professor of Chemistry and Molecular and Cell Biology at the University of California, Berkeley. His research spans the core disciplines of chemical biology, inorganic chemistry, organic chemistry, and molecular biology, focusing on the fundamental design and synthesis of new molecules and materials for targeted applications. Specifically, he is interested in creating new chemical tools for imaging and proteomics in the brain and central nervous system and new molecular, biological, and materials catalysis for energy conversion and solar fuels. He is the recipient of numerous awards, including the ACS Eli Lilly Award in Biological Chemistry and the ACS Nobel Laureate Signature Award in Graduate Education. Research webpage: <http://www.cchem.berkeley.edu/cjcgrp/>.



Mohamed Eddaoudi

King Abdullah University of Science & Technology, Saudi Arabia

Professor Mohamed Eddaoudi's research activities are aimed at developing new strategies for the design and synthesis of functional materials from molecular building blocks in order to address some challenging societal needs such as clean energy alternatives, reduction of greenhouse gas emissions, and remediation of chemical and biological threats. He is currently a Professor of Chemical Science at King Abdullah University of Science and Technology and the Associate Director of the Advanced Membranes and Porous Materials Research Center in Saudi Arabia. He is the recipient of numerous awards, including being named as one of the "World's Most Influential Scientific Minds" in 2014 and a NSF Career Award from the National Science Foundation (USA). Currently, he is an Associate Editor for *Journal of Materials Chemistry*. Research webpage: <http://ampm.kaust.edu.sa/Pages/home.aspx>.



Stephen Hyde

Australian National University, Australia

Professor Stephen Hyde is in the Department of Applied Mathematics at Australian National University. His areas of expertise are in surface and structural properties of condensed matter as well as soft condensed matter. His current research interests lie in the structuring of complex, physical, geological, and biological systems and the relevance of low-dimensional geometry and topology. Physical structures examined include self-assembly of molecular and macromolecular amphiphiles and lipids in solution into liquid crystals, and formation of inorganic materials in biological and abiotic conditions. He is also interested in the characterization and enumeration of geometric networks in various spaces, which include geometrically ordered crystalline networks and related disordered variants. Research webpage: http://people.physics.anu.edu.au/~sth110/sth_papers.html.



Sumio Iijima

Meijo University, Japan

Professor Sumio Iijima's well-known and respected research career has primarily focused on nanoscience, crystallography, electron microscopy, solid-state physics, and materials science. He is recognized as the inventor of carbon nanotubes (*Science*, 1991), which is a discovery that has had an immense influence on the condensed matter and materials science research fields. For this work, he won the Kavli Prize for Nanoscience and the Benjamin Franklin Medal in Physics among many other awards. Presently, he is Professor at Meijo University, Director of the AIST/Nanotube Research Center, Distinguished Invited University Professor at Nagoya University, and a Senior Research Fellow at NEC Corporation. Research webpage: <http://nanocarb.meijo-u.ac.jp/jst/english/mainE.html>.



Susumu Kitagawa

Kyoto University, Japan

Professor Susumu Kitagawa is the Director of the Institute for Integrated Cell-Material Sciences and a Professor of Synthetic Chemistry and Biological Chemistry at Kyoto University. Professor Kitagawa has had a very successful scientific career, which has focused on coordination chemistry, porous materials, and inorganic chemistry. Currently, his research group's interest is in developing the chemistry of organic-inorganic hybrid compounds and understanding the physical and chemical properties of porous coordination polymers from which "function-integrated pores" can be developed. He has received a myriad of awards including the 10th Reona Ezaki Award in 2013, the Medal with Purple Ribbon (Japanese government) in 2011, Thomas Reuters Citation Laureate of Chemistry in 2010, and was the 22nd member of the Science Council of Japan in 2011. Research webpage: <http://www.sbchem.kyoto-u.ac.jp/kitagawa-lab/index-e.html>.



Motoko Kotani

Tohoku University, Japan

Professor Motoko Kotani is a mathematician who specializes in geometry, specifically the symmetries of figures. She was awarded the 25th Saruhashi Award in 2005 for her work in “Discrete Geometric Analysis on Crystal Lattices.” More recently, she has been active in promoting collaboration between mathematics and materials science fields as the project leader of “A Mathematical Challenge to a New Phase of Materials Science based on Discrete Geometric Analysis” project for the Core Research for Evolutional Science and Technology (CREST) under the Japan Science and Technology Agency. Presently, she is the Director of the Advanced Institute for Materials Research, Japan and a Distinguished Professor in the Mathematical Institute of Tohoku University, Japan. Research webpage: <http://www.wpi-aimr.tohoku.ac.jp/en/index.html>.



Kazuyuki Kuroda

Waseda University, Japan

Professor Kazuyuki Kuroda's primary research interest is in materials chemistry at nano- and meso-length scales, including materials synthesis based on inorganic-organic interactions. His research group is actively investigating structural control of inorganic materials by utilizing various interactions as well as controlling self-assemblies with novel functions. He has received several awards including the academic award of the Ceramic Society of Japan in 2007 and the 2013 Prizes for Science and Technology (The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology in Japan. He is the Regional Editor for *Microporous Mesoporous Materials* (Elsevier), on the editorial board for *J. Porous Materials* and *J. Nanoscience Nanotechnology*, and a International Editorial Advisory Board Member for *Chemical Communications*. Research webpage: http://www.waseda.jp/sem-kuroda_lab/index-en.html.



Sven Lidin

Lund University, Sweden

Professor Sven Lidin is a Professor of Inorganic Chemistry at Lund University, a member of the Royal Swedish Academy of Sciences since 2002 in the class of Chemistry, and a member of the Nobel Committee for Chemistry since 2003. In 2010, he was elected to both the Royal Physiographic Society in Lund and in Engineering Sciences. His research focus is in materials science and structural chemistry, specifically incommensurate systems. He investigates minimal surfaces, to explain chemical phenomena, particularly the structure of complex and unusual crystalline so-called inorganic substances. Most of his projects involve intermetallics, as these tend to be particularly susceptible to aperiodic phenomena. Research webpage: <http://www.polymat.lth.se/staff/SvenL/SvenL.html>.



Jeffrey R. Long

University of California, Berkeley, USA

Professor Jeffrey R. Long's career has primarily focused on the study of inorganic and solid state chemistry, namely in the development of new approaches to the synthesis of inorganic clusters and solids, with emphasis on controlling structures as a means of tailoring physical properties and reactivity. He is also interested in topics such as electronic and magnetic properties of inorganic materials, single-molecule magnets, metal-organic frameworks, hydrogen storage, carbon dioxide capture, water splitting catalysis, and actinide chemistry. Presently, he is a Professor of Chemistry at University of California, Berkeley and Faculty Senior Scientist in the Materials Division at Berkeley National Laboratory. He has held many key lecturships, most recently the 3M Research Lecturer in Materials Science and the University of British Columbia in 2014. Research webpage: <http://alchemy.cchem.berkeley.edu>.



Lars Öhrström

Chalmers University, Sweden

Professor Lars Öhrström received his Ph.D. from the Royal Institute of Technology, Sweden. Presently, he is a Professor of Inorganic Chemistry at Chalmers University, Sweden. His research focus is on the interactions of metal ions with other molecules. More specifically, his primary research focus is on the synthesis and understanding of metal-organic frameworks, due to their importance in sustainable chemical engineering and potential applications in catalysis and gas storage. Since 2007, he has been engaged in the International Union of Pure and Applied Chemistry (IUPAC). He is a member of the National Committee for Chemistry and a regular contributor to Chemistry World's (Royal Society of Chemistry) popular science podcasts. In 2013, he published the book, *The Last Alchemist in Paris and Other Curious Tales from Chemistry* (Oxford University Press). Research webpage: <http://www.chalmers.se/en/staff/Pages/ohrstrom.aspx>.



Davide M. Proserpio

University of Milan, Italy

Professor Davide M. Proserpio received his Ph.D. from the University of Pavia, Italy. He started his career in the field of applied theoretical chemistry, developing a package for EHT calculations (CACAO). His current research focus is on coordination networks, with a special interest in the topological problems that arise from the complexity of solid-state coordination polymers. These areas of interest include interpenetration and entanglements with a recent *CystEngComm* Highlight article giving prominence to the attractive 'Borromean' series of links. Presently, he is an Associate Professor at the University of Milan, Italy where he received several awards, including Gold Medal Nasini in 2002 from the Italian Chemical Society. He is a prolific publisher (>155 co-authored papers) with >10,000 citations. Research webpage: <http://sctms.ru/davide-m-proserpio/?lang=en>.



Shilun Qiu

Jilin University, China

Professor Shilun Qiu's research at Jilin University centers on molecular engineering, synthesis and catalysis of microporous and mesoporous materials, rational synthesis and hydrogen storage of porous-organic framework materials, and host-guest chemistry: nano-composite in porous materials. He has received several First Grade National Awards for his progress on research. He was the Chief Scientist of National 973 Project in China, which focused on molecular engineering for creating new matter and frontier scientific subjects for creating matter and chemical conversion. He is the President of the Chinese Zeolite Association and Vice President of China Science and Technology Association, Jilin Branch. Research webpage: <http://www.synlab.org.cn/en/2013/11/1716.html>.



Thanh Truong

Vietnam National University - Ho Chi Minh City, Vietnam

Thanh Truong received his B.Eng with First Class Honors in Chemical Engineering from the HCMC University of Technology, Vietnam. After graduation, he worked as a teaching and research assistant in the Organic Synthesis Group at the same university for one year. In 2009, he joined Dr. Daugulis research group at University of Houston, USA for his Ph.D. degree. He is currently appointed as Assistant Professor at HCMC University of Technology, Vietnam. He is interested in developing new catalytic systems using transition metals for a wide range of organic transformations and modification of natural products.



An-Pang Tsai

Tohoku University, Japan

Professor An-Pang Tsai is a professor at Tohoku University as well as the group leader of the Alloy Catalyst Materials Group, Hydrogen Materials Unit, Environment and Energy Materials Division at the National Institute for Materials Science in Japan. His research is mainly focused on quasicrystals and related intermetallic compounds, specifically their structure, fundamental properties and applications. Tsai is involved in the discovery of new quasicrystals, production of single quasicrystals, and the structural analysis and study of their surfaces. His research work on applications such as development of composite materials, including quasicrystal-reinforced high-strength magnesium alloys and quasicrystal-based catalysis are in progress. Research webpage: http://samurai.nims.go.jp/TSAI_An pang-e.html.



Omar M. Yaghi

University of California, Berkeley, USA

Professor Omar M. Yaghi's research encompasses the synthesis, structure and properties of inorganic and organic compounds and the design and construction of new crystalline materials. He is widely known for inventing several extensive classes of new materials termed metal-organic frameworks, covalent organic frameworks, and zeolitic imidazolate frameworks. Professor Yaghi is ranked among the top 10 most highly cited chemists worldwide over 2000-2010. He has received countless awards for his work, including the 2009 American Chemical Society Chemistry of Materials Award and the International Izatt-Christensen Award in Macrocyclic Chemistry. He is the James and Neeltje Chair Professor of Chemistry at UC Berkeley, Senior Staff Scientist at Lawrence Berkeley National Laboratory, and Co-Executive Director of MANAR. Research webpage: <http://yaghi.berkeley.edu/>.



Haw Yang

Princeton University, USA

Professor Haw Yang received his Ph.D. from University of California, Berkeley. He was awarded the Camille Dreyfus Teacher-Scholar Award in 2008, the Alfred P. Sloan Fellowship in 2006, the Hellman Family Fund Award in 2005, and the NSF CAREER Award in 2004. Yang leads an experimental physical chemistry group working on single-molecule chemical dynamics. He develops new single-molecule and single-nanoparticle based methods for the study of complex systems, striving to arrive at a level of understanding that affords a quantitative prediction of the dynamics and how they contribute to systems behavior. He is presently a Professor of Chemistry at Princeton University. Additionally, he serves as an Associate Editor of *Chemical Science* and on the Advisory Board of *Chem. Soc. Rev.* Research webpage: <https://www.princeton.edu/~yanglab/>.



Kyung Byung Yoon

Sogang University, Korea

Professor Kyung Byung Yoon received his Ph.D. from the University of Houston, USA and is currently a Professor of Chemistry as well as the Director of the Center for Nano Materials of the Korea Center for Artificial Synthesis at Sogang University. His research area includes artificial photosynthesis, assembly of zeolite microcrystals into uniformly aligned monolayers and multilayers, applications of organized zeolite microcrystals (supercrystals), development of zeolite-based 2nd- and 3rd- order nonlinear optical materials, photovoltaic applications of quantum dot-incorporated zeolite films, synthesis of new zeolite crystals, and the development of molecular sieving membranes. He has won many awards, including the Korea Science Award in 2010, the Academic Award from National Academy of Science in 2008, and the Sogang Jubilee Award in 2010. Research webpage: www.kbyoon.com.

MEKONG TOUR

CAI BE & VINH LONG (01 DAY)

07:00

Depart from TheSinhTourist office to Cai Be by air-conditioned bus (about 100km).

09:30

Arrival in Cai Be.

Take a boat trip to discover the beauty of Cai Be floating market with local people selling, buying, and exchanging goods from their boats. Go to a nearby village to visit a local workshop to see rice paper making and the coconut candy production process. Enjoy free snake wine, honey tea, etc ... and discover the daily activities of locals.





12:00

Go to Chin Thuong restaurant for lunch and enjoy traditional Vietnamese music. After lunch, take a boat along the Mekong River to Vinh Long - a center for tropical fruit then stop in for a short visit to Vinh Long market. Go across My Thuan suspension bridge and drop by Mekong Rest Stop before going back to Saigon.

18:00

The tour ends at TheSinhTourist Office.





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- **Pharmaceuticals**
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- **Metal Hydrides**
- **Polymers and Membranes**
- **Catalysts...**

...and many other materials.

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150

YEARS

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Structures
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