

Monday, February 15, 2016

The Alchemy of Vacuum

or ... When Is a Vacuum not a Vacuum?

3 PM Annenberg Auditorium

Snite Museum of Art - Reception to follow

Thomas W. Ebbesen

USIAS, University of Strasbourg, France



We think of a vacuum as containing absolutely nothing, like the void of outer space. However, most empty space contains energy in the form of electromagnetic waves. Strong coupling of this light radiation and matter can give rise to a multitude of exciting physical effects through the formation of hybrid light-matter states. When molecular materials with high transition dipole moments are placed in the confined fields of metallic microcavities or surface plasmons, many exciting consequences can be observed. For example, so-called Rabi splittings approaching very large energies (e.g., 1 electron-volt or eV) are observed due to the interaction with the vacuum electromagnetic field. This leads to fundamental changes not only to the properties of the material, but also to the properties of the vacuum itself and, hence, the coupled system. While strong coupling has been extensively studied due to the potential it offers in physics, such as room temperature Bose-Einstein condensates, and revolutionary devices, such as so-called thresholdless lasers, the many additional implications for molecular and material science have remained mostly unexplored. After introducing the fundamental concepts, examples of thermodynamic, chemical and material properties of strongly coupled systems will be given to illustrate the potential of light-matter states for materials and for devices.

Thomas Ebbesen was born in Oslo, Norway, in 1954. He received his BS from Oberlin College, Ohio, majoring in chemistry and biology, and his PhD in physical chemistry from the Curie University in Paris. Ebbesen then worked both in academic and corporate research institutions, such as the Notre Dame Radiation Laboratory, the NEC Fundamental Research Laboratory (Japan) and NEC Research Institute (Princeton), before returning to France in 1999 to help build a new laboratory – the Institut de Science et d'Ingénierie Supramoleculaire at the University of Strasbourg, which he headed from 2005 to 2012. He is currently the director of the International Center for Frontier Research in Chemistry and the University of Strasbourg Institute for Advanced Study. He holds the chair of physical chemistry of light-matter interactions. Ebbesen has received many awards for his pioneering research on nanostructured materials, including the 2014 Kavli Prize in Nanoscience. He has been elected to the Norwegian Academy of Science and Letters and the French Academy of Science.

Tuesday, February 16, 2016

Duo Recital: Hayashi-Ebbesen and Buranskas

Pianist Masako Hayashi-Ebbesen and Cellist Karen Buranskas will perform works by Beethoven, Schumann, Chopin and Debussy. This duo has performed widely during the 80s and 90s in the US and Japan, including a concert at Carnegie Recital Hall.

7 PM Annenberg Auditorium, Snite Museum of Art - Reception to follow

Free admission, no tickets required



"exceedingly fine duo ...
playing was deft
yet forceful ... a program
backed by technical
sureness and
confidence"
– The New York Times

Masako Hayashi-Ebbesen - Piano

Masako Hayashi-Ebbesen has been active as a soloist and chamber pianist in Japan, France and the US. She has a BM in piano performance from the Oberlin Conservatory of Music and a MS of music with high distinction from Indiana University at Bloomington. Her teachers have included Jack Radunsky, Gyorgy Sebok, John Owings and the New Hungarian Quartet.

Since the beginning of her performing career, critics on both sides of the Pacific and the Atlantic have held her poetic expression and ardor in high acclaim. She has shared the stage in major halls of New York, Tokyo, Chicago, Paris and Philadelphia with duo partners of renown from around the world and has appeared in guest recital series of numerous universities and conservatories in the US, Japan and Europe.

Her multicultural insight acquired on three continents has been shared at master classes and the summer chamber music academies she has held with the Strasbourg Chamber Ensemble in various regions of France. Masako taught piano and chamber music at Princeton University until 1999 before moving to Strasbourg where she resides and teaches at the National Conservatory of Strasbourg and the Académie Supérieure de Musique de Strasbourg.



Karen Buranskas - Cello

Cellist Karen Buranskas has performed throughout the world as a soloist and chamber musician on concert stages in London, Tokyo, São Paulo, Taipei, New York and cities throughout the US.

A first-prize winner in both the Concert Artists Guild Competition in New York City and the Aldo Parisot Competition in Brazil, Buranskas was awarded a Solo Recitalist grant by the National Endowment for the Arts. As a recording artist, Buranskas has released four highly acclaimed discs for Centaur Records, two with the Notre Dame String Trio and two solo CDs. The American Record Guide review of the CD featuring 20th century works for solo cello stated, "Karen Buranskas is a magnificent cellist. Her playing...is sinewy, noble, richly eloquent in tone and phrasing." A fifth CD will soon be released in which Buranskas collaborates with pianist John Blacklow in performances of sonatas by 20th century Russian composers.

Buranskas studied with cellists Janos Starker, Fritz Magg, Gregor Piatigorsky and Aldo Parisot, graduating from Indiana University with a BA of music degree and performer's certificate and a MS of music degree from Yale University. She is currently an associate professor in the Department of Music at the University of Notre Dame.