

**James K. Gimzewski**

Invited Presentations 2022

493. "Nanoscale Neuromorphic Networks and Criticality, A perspective and outlook"  
The 4th International Symposium on Neuromorphic AI Hardware, ART HOTEL,  
New Tagawa, Kitakyushu, Japan, December 14<sup>th</sup>, 2022
  
492. "Nanoscale Neuromorphic Networks and Criticality, A perspective and outlook"  
MANA International Symposium, The International Center for Materials  
Nanoarchitectonics (MANA), Tsukuba, Japan, December 9<sup>th</sup>, 2022
  
492. "Quantum Mechanics and Music"  
UCLA Art|Sci Center, Summer School, UCLA July 29<sup>th</sup>, 2021
  
491. "The Incredible Journey: Nanomedicine"  
UCLA Art|Sci Center, Summer School, UCLA. July 26<sup>th</sup>, 2021
  
489. "Nanomedicine"  
International Workshop on Emergence of Life, Nano-Bio Science, March 10-11, 2021  
Area of Life Science and NanoBiology, Division of Strategic R&D, Saitama University  
Invited talk, online via Zoom
  
488. "Brain on the Edge"  
MANA International Symposium, MANA, NIMS, Tsukuba, Japan, March 2-3, 2021  
Keynote Lecture March 3<sup>rd</sup>. online via Zoom
  
487. "Atomic Switch Networks for Neuroarchitectonics"  
MEMRISYS Online Mini-Conference  
18-19 November, 2020, MANA Selected Workshop, Tsukuba, Japan, online via Zoom
  
486. "A career in Chemistry" FREE virtual event for Santa Clarita and other schools around  
the country, 6th Annual Green STEM Summit, Santa Clarita, October 24, 2020
  
485. Cooking Lesson: "Scottish (Vegan) Haggis" (online)  
Los Angeles Hub of ARS ELECTRONICA 2020 Telluric Vibrations, The UCLA ArtSci  
Center Ars Electronica festival "Kepler's Gardens"  
September 10, 2020

484. “Music and Quantum Mechanics” (online)  
Los Angeles Hub of ARS ELECTRONICA 2020 Telluric Vibrations, The UCLA ArtSci Center Ars Electronica festival “Kepler’s Gardens”  
September 11, 2020
483. “Atomic Switch Network (ASN), a NanoSystem with brain-like structure and functional dynamics”  
Neumorph Center, Kyushu Institute of Technology, Kitakyushu, Japan (ZOOM), June 4<sup>th</sup>, 2020
481. ” Emergent Atomic Switch Networks for Neuroarchitectonics”  
Plenary Talk, Virtual Global Conference, Supercomputing Frontiers- 2020 Europe,2020,Warsaw, Poland (VIRTUAL) March 23 – 25, 2020
480. “Emergence in Physical systems Vacuum Fluctuations in Biology”  
Advanced Propulsion and Energy - 2020 MIT Independent Activities Period (IAP), January 15<sup>th</sup>, 2020 MIT, Boston
479. “Brain-like Computation system using Atomic Switch Networks”  
Colloquium, Worldwide scientific leaders on trending topics at INL, November 26th | 2019, INL International Iberian Nanotechnology Laboratory, Braga, Portugal
478. “From Man to Molecules: Nano-Technology and the Next ‘Big Bang’” Leonardo da Vinci, Inventing the Future: Flight, Automata, Art, Anatomy, October 18-19, 2019 CNSI UCLA
477. Plenary Talk “Scanned Probe Microscopies, Mechanobiology and Nanobiology”  
International Forum on Microscopy 6-8 September 2019, Beijing, China IFM 2019
476. “Casimir Experiments”, UnLAB Meeting August 1-2, 2019, Ginzton Lab. Stanford University, Stanford.
475. “Why Science needs Art” Tacit Engagement in the Digital Age, 26-28 June 2019  
A joint conference by the 'Re-' Interdisciplinary Network (CRASSH) and the AI & Society Journal, University of Cambridge, UK
474. 3rd International Symposium on Nanoarchitectonics for Mechanobiology 3rd International Symposium on Nanoarchitectonics for Mechanobiology (ISNM) March 7th – 8th, 2019 Venue: WPI-MANA Auditorium, NIMS, Namiki, Tsukuba “New Developments in the Mechanobiology of Exosomes”
473. Altice FÓRUM BRAGA | October 15-17 2018  
INL SUMMIT 2018, TRANSFORMATION OF THE GLOBAL ECONOMY,  
International Iberian Nanotechnology Laboratory Braga, Portugal
472. “Error of Errors”, Invited, Error - the Art of Imperfection, 6 - 10 September 2018, Ars

Electronica Festival, Linz, Austria

471. Exhibition with V. Vesna  
13-15 September 2018 - 8:00pm  
Blue Morph at SPECULUM ARTIUM in Trbovlje, Slovenia
470. “Nanobubbles”, SciArt Nanolab, 2018 Ecological Mind, CNSI, UCLA
469. “The Radical Atom: Mechanosynthetic 3D Printing of Atomically Precise SPM Tip.  
Advanced Manufacturing Office, Peer Review, July 17-19 2018, Holiday Inn Capitol,  
Washington DC
468. "Atomic force microscopy as a nanoanalytical tool for exosomes and other extracellular vesicles" The AFM BioMed Conference (2017) 8th international meeting on atomic force microscopy in life sciences and medicine September 4th – 8th 2017, Kraków, Poland.
467. Art and science: Brain Laznia Contemporary Art Center, ul. Jaskółcza  
2<sup>nd</sup> September 2017, Gdańsk, Poland
466. “Exosomes”, CSEM November 13<sup>th</sup>, 2017, Neuchatel, Switzerland
465. Neuroarchitectonic Devices using Atomic Switches, IMT Distinguished Lecture  
November 11, 2017, School of Engineering EPFL, Swiss Federal Institute of Technology  
Lausanne , Lausanne, Switzerland
464. (Plenary)International Conference on Molecular Electronics and Bioelectronics  
M&BE9) Ishikawa Ongakudo, June 26<sup>th</sup>, 2017. Kanazawa, Japan
463. “ NANO, ECO AND HOPE” ECOCENTRIC ART+SCIENCE SYMPOSIUM”  
Open-Mic. Marathon Symposium, CNSI Auditorium, California Nanosystems Institute,  
UCLA, April 21,2017.
462. “Building artificial brain parts”, 14th Annual World Congress of the Society for Brain  
Mapping and Therapeutics (SBMT), Millennium Biltmore Hotel, Los Angeles, CA, April  
20, 2017.
461. “Atomic Switches for Neuroarchitectonics” MANA/ NIMS International Symposium on  
Atomic Switch: Invention, Practical Use and Future Prospects, Okura Frontier Hotel,  
Tsukuba, Japan, March 28, 2017.



449. “The Cascading Nature of Everything”, TedX Echo Park, Paradigm Shift, Iam8 Studios, Echo Park, California, May 14, 2016
448. “The Incredible Journey: Nanomedicine”, Public Seminars about Nanotechnology, Edificio dos Congregados, International Iberian Nanotechnology Laboratory, Braga, Portugal, Feb 17, 2016
447. “Seeing and doing the impossible”, Encontro Nacional de Estudantes de Fisica, ENEF, International Iberian Nanotechnology Laboratory, Braga, Portugal, Feb 18, 2016
446. “Development of a “Brain-Like” computation system using atomic switch networks”, NanoPortugal International Conference, International Iberian Nanotechnology Laboratory, Braga, Portugal, Feb 16, 2016
445. “Application of Nanomechanics to Cancer”, Mechanobiology Symposium, MANA WPI Center for Materials Nanoarchitectonics- National Institute of Materials Sciences, Tsukuba, Japan, July 30, 2015
444. “Introduction to Nanoscience”, Nanolab, UCLA Summer Institute, Art|Sci Center Summer Program, California Nanosystems Institute, Los Angeles, California, July 20, 2015
443. “Self-organization and Emergence of Dynamic Systems”, Science and Creativity Advisory Board, Studio 360 with Kurt Andersen, WNYC Public Radio, Manhattan, New York, June 12, 2015
442. “Application of AFM Technology in Cancer and Cell Management” The 534th Session: Nanobiomechanics in Cancer Prevention and Treatment. The Xiangshan Science Conferences (XSSC), Fragrant Hills, Beijing, China, June 23-24, 2015
441. “The Self- Organization of Dynamical Structures” The Fourth Annual Psychology Interdisciplinary Events Symposium, CNSI Auditorium, University of California Los Angeles, Los Angeles, California, May 18, 2015
440. “Atomic Force Microscopy of cells as a diagnostic for cancer, cancer prevention and detection of chemo-resistance” Saitama University Symposium, Tokyo, Japan, March 9, 2015
439. “Atomic Force Microscopy of cells as a diagnostic for cancer, cancer prevention and detection of chemo-resistance” AFM Biomedical Conference, UC San Diego, San Diego, California, December 15-19, 2014
438. “Self- Organization and Emergence of Dynamical Structures in Atom Switch Networks” FON Functionality of Organized Nanostructure, Tsukuba, Japan, November 26-28, 2014
437. “Self-organization and emergence of dynamical structures in neuromorphic atomic switch networks” Bristol Nanoscience Symposium, Bristol, UK, September 15-16, 2014
436. “Seeing the unseen using peak force AFM of brain cancer (glioblastoma) exosomes and neuronal (drebrin) actin complexes” NC-AFM Conference, Tsukuba, Japan, August 4-8,

2014

435. “Introduction to Nanoscience”, Nanolab, UCLA Summer Institute, Art|Sci Center Summer Program, California Nanosystems Institute, Los Angeles, California, July 21, 2014
434. “Building a brain using self organization”, STAM 15<sup>th</sup> Anniversary Symposium, University of Tokyo, Tokyo, Japan, July 3, 2014
433. “Cancer Detection Using AFM” Nano-Cancer Symposium, Chinese Academy of Sciences Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety, Institute of High Energy Physics, Beijing, China, May 17-18, 2014
432. “Building a Brain: The atomic switch network” TTI/ Vanguard, The Advanced Technology Conference Series, Connecting the Bots, Boston, Massachusetts, April 23-24, 2014
431. “Art|Sci in the evolution of intelligence” Interrogating Methodologies, exploring boundaries in Art & Science, University of California, Santa Barbara, April 18-19, 2014
430. “Exosomes” MANA International Symposium- National Institute of Materials Sciences, Tsukuba, Japan, March 5-7, 2014
429. “Self-organization and emergence of dynamical structures in neuromorphic atomic switch networks” TNT: Trends in Nanotechnology Symposium- Tokyo Big Sight, Tokyo, Japan, January 29-31, 2014
428. “Exosomes” Nanotechnology and Nanomedicine Conference- University of Bristol, United Kingdom, November 6-8, 2013

427. “From STM Point Contact to Building a Brain” Heini Rohrer Memorial Symposium, , Zürich, Switzerland, October 31, 2013
426. “Atomic Switch Networks” Institute of Physics, Bristol, UK, October 29, 2013
425. “Atomic Switch Networks: Dynamical Systems for Universal Computation” Discussion Workshop: New Horizons in Electrochemistry- at the Boundary to Physics and Materials Science, Capri, Italy, August 26-28, 2013
424. “Atomic Switch Networks: Dynamical Systems for Universal Computation” MANA WPI Site Visit, National Institute of Materials Sciences, Japan, August 20, 2013
423. “Integration of Art and Science” Aquarium of the Pacific, Long Beach California, May 16, 2013
422. “Duality” LASER, Leonardo Art Science Evening Rendez-Vous, University of California, Los Angeles, May 4, 2013
421. “Biologically Inspired Self-organized Brain-like Networks exhibiting Critical Phenomena” 7<sup>th</sup> International Conference on Molecular Electronics an Bioelectronics, Fukuoka, Japan, March 19, 2013
420. “A Thinking Machine”, MANA 5<sup>th</sup> Anniversary Memorial Symposium, National Institute of Materials Sciences, Tsukuba, Japan October 3, 2012
419. “Nanotechnology- an Art- Sci Exploration” Reseau Francais des Institutes d’Etudes Avancees, RFIEA, Marseille, France, September 2012
418. “Neuromorphic Switch Networks”, Institut Méditerranéen de Recherches Avancées, Marseille, France, June 27, 2012
417. “Nanomedicine”, Swiss NanoConvention, CSEM Centre d’Electronique de Microtechnique SA, , Lusanne-Beaulieu, Switzerland, May 21-24, 2012
416. “Collaborating with Artists”, Science and Creativity Advisory Board, Studio 360 with Kurt Andersen, New York, May 11, 2012
415. “30 Years for the Scanning Tunneling Microscope” MANA International Symposium, February 29- March 2, 2012, Tsukuba, Japan
414. “There is no room at the bottom” MANA Grand Challenge Meeting, NASU Conference, April 25-26, 2012, Tsukuba, Japan
413. “Morphonano” with V.Vesna, Beall Center for Art +Technology, University of California at Irvine, Irvine, California May 5, 2012
412. “Nanotechnology” Technolink President’s Club Forum, Visionary Panelist, Los Angeles,

California, October 12, 2011

411. "Blue Morph and Self-Organized Criticality," with V. Vesna, Artus Court, Art & Science Meeting, Gdansk, Poland, May 24, 2011
410. "Self Organized Criticality," Institut Méditerranéen de Recherches Avancées, Marseille, France, May 23, 2011
409. "Blue Morph and Self-Organized Criticality," with V. Vesna, Rensselaer Polytechnic Institute, Troy, NY, April 12, 2011.
408. "Self-organized Critical Electronics Using Fractally Wired Atom Switches," MANA International Symposium, National Institute of Materials Science, Japan, March 2-4, 2011.
407. "From Nano Science to Device Art - Introducing the UCLA Art|Sci Center," JST/CREST Device art Symposium on Art and Science, MIRAikan National Museum of emerging Science and Innovation, Tokyo, Japan, December 20, 2010.
406. "What Art can do for Science: Learning to Learn," The 11th Consciousness Reframed Conference: Making Reality Really Real, Trondheim, Norway, November 4-6, 2010.
405. "High Resolution atomic Force Microscopy and Medicine," International Conference in Nonmaterial and Renewable Energy, Safi, Morocco, July 5-8, 2010.
404. "Nano-Neuromorphic Physical Intelligence: Atom-Switch Synapses Embedded in Nueroplastic-like Dendritic Wiring," with M. Aono, 1st Int'l Workshop on Computing with Spatio-Temporal Dynamics, Tokyo, Japan, June 23-24, 2010.
403. "MANA Brain," IBM-NIMS Symposium: Characterization and Manipulation at the Atomic Scale, Tsukuba, Japan, June 14-15, 2010.
402. Honorary doctorate acceptance speech, University Day, University of Strathclyde, Glasgow, Scotland, May 5, 2010
401. "Interfacial Intelligence," closing workshop, Institut Méditerranéen de Recherches Avancées, Marseille, France, November 24, 2009.
400. "Nano tips: Exploring this planet, your body and beyond," seminar, University of Glasgow, Department of Electronics, Scotland, September 4, 2009.
399. "Nano tips: Exploring this planet, your body and beyond," Carnegie Centenary Lecture 2009, University of Strathclyde, Scotland, September 3, 2009.
398. Conference Opening Address and "Sub-100nm biological particle imaging and

- characterization with a purpose built NC-AFM,” Seeing at the Nanoscale VII, Santa Barbara, CA, July 28-31, 2009.
397. “Nanomechanics in Medicine: Green Tea,” The Royal Society, London, UK, July 9, 2009.
  396. “Introduction to AFM sensors,” and “Nano-sensors for cells and bacteria,” Nano-Bio-Sensing Summer School, Ecole Polytechnique Federale de Lausanne, Switzerland, June 29-July 3, 2009.
  395. “Nanoneuromorphic Networks,” 2009 University of Washington Center on Nanotechnology Conference and UW/NIMS MoIAT Forum, Seattle, WA, June 10-12, 2009.
  394. “Nano Tips: Exploring This Planet, Your Body and Beyond,” S. Town Stephenson Distinguished Lecture, Washington State University, Pullman, WA, March 26, 2009.
  393. “MANA-CNSI Overview,” MANA International Symposium, Tsukuba, Japan, February 26, 2009.
  392. “New Technologies in AFM to Revolutionize Nanomedical Diagnostics,” CNSI-UK Nano Workshop, California NanoSystems Institute, Los Angeles, CA, January 29, 2009.
  391. “Nanocharacterization,” CNSI Membership Luncheon, California NanoSystems Institute, Los Angeles, CA, January 22, 2009.
  390. “Sub-100nm biological particle imaging and characterization with a purpose built nc-AFM,” CNSI-JAIST Workshop, California NanoSystems Institute, Los Angeles, CA, January 15, 2009.
  389. Honoris Causa acceptance speech, “Scanning Probe Microscopy: From Atoms to Cells,” University of Aix-Marseille II, November 27, 2008.
  388. “Nanomedicine,” CINaM-CNRS, Campus de Luminy, University of Aix-Marseille II, France, November 27, 2008.
  387. “Blue Morph,” Centre for Contemporary Art Laznia in Gdansk, Poland, November 24, 2008.
  386. “Nanomechanics in Medicine: AFM-based Analysis of Green Tea Extract (GTE)-induced Anticancer Properties in Human Cancer Cells,” 2008 International Conference on Nanoscience + Technology (ICN+T), Denver, CO, July 22, 2008.
  385. “The Age of Nanotechnology,” The Institute of Engineering and Technology, London, UK, July 8, 2008.

384. "The Age of Nanotechnology," Naughton Institute, Trinity College Dublin, Ireland, July 7, 2008.
383. "Blue Morph: ritual metamorphosis of art|science realms," The Planetary Collegium's IXth International Research Conference, Vienna, Austria, July 3-5, 2008.
382. Panelist, "Nanomedicine: Nanosensors And Nanodevices For Human Health Management," 2008 BIO International Convention, San Diego, CA, June 18, 2008.
381. Keynote lecture at exhibition opening, "Nano, Poetics of a New World/Nano, Poética de um Mundo Novo," FAAP Brazilian Art Museum, São Paulo, Brazil, April 13, 2008.
380. Session chair, International Center for Young Scholars (ICYS) Workshop 2008, National Institute of Materials Science, March 12, 2008.
379. Keynote lecture, "The Methodology, Physics and Biology of Nanomechanics in Biological Matter," International Center for Young Scholars (ICYS) Workshop 2008, National Institute of Materials Science, March 11, 2008.
378. "Single molecule origami and morse code of RNA," International Center for Materials Nanoarchitectonics (MANA) International Symposium 2008, National Institute of Materials Science, Japan, March 10, 2008.
377. Panelist, "Biomaterials and Medicine," UCLA-ASMeW Waseda Joint Symposium, California NanoSystems Institute, March 6, 2008.
376. Discussion moderator, NSF-MEXT Symposium, California NanoSystems Institute, March 4, 2008.
375. "Blue Morph: Surges of Nanocellular Transformations," MetaMorphosis: Challenging Arts and Sciences, International Centre for Art and New Technologies (CIANT), Czech Republic, November 8, 2007.
374. "Nanomechanics of Human Metastatic Cancer Cells in Clinical Pleural Effusions," Symposium on NanoBiotechnology, California NanoSystems Institute, UCLA and the Center for NanoBio Integration, University of Tokyo, Los Angeles, CA, November 1-2, 2007.

## **2007**

373. Keynote address at inauguration of International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science, Japan, August 30, 2007.

372. "Nanomechanics in Medicine," Department of Physics, University of Bristol, UK, August 2, 2007.
371. "Nanomechanics in Medicine," CRMCN-CNRS, Campus de Luminy, University of Marseille, France, July 19, 2007.
370. "Blue Morph," Bibliotheque de l'Alcazar, Marseille, France, Jul 18, 2007.
369. "Current and future developments of nanotechnology in medicine," INASCON Conference, Silkeborg, Denmark, July 10, 2007.
368. "Nanometrics in Biology," Nanoscience Center, University of Aarhus, Denmark, July 9, 2007.
367. "Nano: The Role of Technology in the Future," The First Summit Meeting of the Planetary Collegium, Montreal, Canada, April 21, 2007.
366. "Nanotechnology and the Future," UC System-Wide Technology Transfer Forum on Nanotechnology, San Francisco, CA, April 13, 2007.
365. "Nanometrics and Nanomechanics: Life Science," International Symposium on Nanospace and Materials, University of Kumamoto, Kumamoto, Japan, March 15, 2007.
364. "Nanomechanical Medicine: Single Molecule, Cell and Bacterial Architectonics," National Institute of Materials Science, Tsukuba, Japan, March 13, 2007.
363. "Morphing Art and Science Labs: Negotiating Unknown Terrain," College Art Association 95th Annual Conference, New York, NY, February 17, 2007.
362. "Doing Nanotechnology Out of the Box," Rowland Institute, Harvard, Cambridge, MA, February 16, 2007.
361. "Nanomechanical Medicine: Single Molecular, Architectonic, Cellular-Holistic and Whole Organism Metamorphosis," Santa Fe Institute, NM, February 1, 2007.
360. "Nanomedicine," Department of Physics, National University of Singapore, Singapore, January 3, 2007.
359. "Nano," public lecture, Singapore Science Centre, Singapore. January 2, 2007.

## **2006**

358. Panelist/speaker, Technology Forecast 2007, Technolink Association, Los Angeles, CA, December 13, 2006.
357. STM demonstration and seminar, Santa Monica High School, Santa Monica, CA, December 12, 2006.

356. “Nanometrics of Biosystems,” speaker and session chair, International Conference on Nanoscience and Technology 2006 (ICN+T), Basel, Switzerland, July 30-August 4, 2006.
355. “Nanoscience and its Technological Potential in Medicine,” Micro Nano Breakthrough Conference (Oregon State University), Vancouver, WA, July 25, 2006.
354. “Robotics and Nanotechnology on the Atomic and Molecular Scale,” The 7th International Workshop on the Algorithmic Foundations of Robotics (WAFR), New York, NY, July 17, 2006.
353. “Nanotechnology and Medicine,” seminar, National Centre for Biological Sciences, Bangalore, India, June 26, 2006.
352. “Nanotechnology: The Ultimate End Game?” inaugural and keynote address, International Conference on Nanotechnology Materials and Methods, Coimbatore Institute of Technology, India, June 23, 2006.
351. “Bio-Nanophysics” lecture, Annual Conference of the Scottish Universities Physics Alliance (SUPA), Glasgow, Scotland, UK, June 14, 2006.
350. “Nanotechnology: The Ultimate End Game?” Department of Physics, University of Oregon, Eugene, OR, May 25, 2006.
349. “Nano-Fusion,” Future in Review (FiRe) A Strategic News Service Conference, San Diego, CA, May 17, 2006.
348. “Nanotechnology: The Ultimate End Game?” Department of Chemistry Graduate Student Association, Stanford University, Palo Alto, CA, April 27, 2006.
347. “Thinking Atoms,” panelist, Art|Sci Center, University of California, Los Angeles, April 19, 2006.
346. “Nanotechnology: The End Game of Materialism?” Society of Cosmetic Chemists California Chapter, Los Angeles, CA, February 28, 2006.
345. “Sonocytology,” The Mindful Awareness Research Center, University of California, Los Angeles, January 30, 2006.
344. “New Uses of Nanometer Technologies,” California NanoSystems Institute, University of California, Los Angeles, January 17, 2006.

## **2005**

343. “Nanoarchitectonics: Butterflies Fly in the Rain,” National Institute of Materials

- Science, Japan, December 12-19, 2005.
342. “Nanoarchitectonic and Nanomechanical Approaches to Biological Systems,” Corning Corporation, Corning, NY, Decemeber 6, 2005.
  341. “Nanoarchitectonics,” seminar, School of Medicine, Rayne Institute, University College London, London, UK, October 24, 2005.
  340. “Pyrofusion,” School of Chemistry, St. Andrews University, Scotland, UK, October 21, 2005.
  339. “Nano Architectonics,” Materials Science Institute Retreat 2005, University of Oregon, Skamania, WA, September 14, 2005.
  338. “Futures of Design,” Physics of Aesthetics, University of Barcelona and Fundacion Caixa de Catalunya and Generalitat de Catalunya, Barcelona, Spain, September 5-8, 2005.
  337. “Biologically Inspired Morphing Structures,” US Insitute of Defense Analysis Meeting, Alexandria, VA, August 25-26, 2005.
  336. “Shifting Paradigms: Pocket sized nuclear fusion, cellular mechanics and the role of a tip,” Nanotechnology and Department of Physics, University of Bristol, Bristol, UK, June 20, 2005.
  335. “Bottom-up Nanomanufacturing,” speaker and session chair, EPSRC Nanotechnology Theme Day, London, United Kingdom, June 16, 2005.
  334. “Nanomechanics of Single Cells,” Nobel Symposium 131 – Controlled Nanoscale Motion in Biological and Artificial Systems, Bäckaskkog Slott, Sweden, June 14, 2005.
  333. “Nanomechanical Probes of Biosystems.” The 11th International Meeting on DNA Computing, London, Ontario, Canada, June 8, 2005.
  332. “Nanomechanics,” seminar, Frontiers of Science Program, New York Academy of Sciences, New York, NY, March 3, 2005.
  331. “Science of Scientist,” California Science Center, Los Angeles, CA, February 17, 2005.
  330. “Surprises with Nanotips,” seminar, Department of Chemistry, University of California, Riverside, February 2, 2005.
- 2004**
329. “Schrödinger’s Cell Phone,” Consciousness Reframed – Qi and Complexity. The Planetary Collegium, Beijing, China, November 24-27, 2004.

328. “Nanomechanical Probes from Bacteria to Nuclear Fusion,” The First International Symposium on the Functionality of Organized Nanostructures (FON '04), Tsukuba, Japan, November 30-December 2, 2004.
327. Keynote address, Seeing at the Nanoscale II International Conference, Grenoble, France, October 13- 15, 2004.
326. Participant, Strategies for Public Engagement in Nanoscale Science and Engineering, National Science Foundation, Washington, DC, September 2-3, 2004.
325. “Singing Cells and Molecular Wheels: Stories from the Frontiers of Nanotechnology,” Philosophical Club Annual Meeting, Steve Martin’s Residence, Beverly Hills, CA, August 28, 2004.
324. “Nanomechanics” Center of Super-Diamond and Advanced Films, City University of Hong Kong, June 28, 2004.
323. “Nanomechanics from Molecules to Cells to Butterflies,” Public Presentation on Nanotechnology, The Chinese University of Hong Kong - Chung Chi College - Department of Electronic Engineering & Faculty of Science, Hong Kong, June 24, 2004.
322. “Nanomechanics of Cells,” University of Basel, Institute of Physics, Basel, Switzerland, June 23, 2004.
321. “Talking with Stem Cells: Differentiating Agents: A Novel Approach to the Rescue of Injured Tissues,” Nanoscale Science and Technology in Cell Fate Assessment: Translating Biomolecular Recognition into Nanomechanics, Bologna, Italy, June 20-22, 2004.
320. “Where will the next wave of technology take us...?” Technolink Technology Trends Forum 2004, panel member, Los Angeles, CA, June 8, 2004.
319. “Nanoscale Science with a Single Molecule and Single Cell,” plenary lecture, Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, China, May 27, 2004.
318. “Nanoscale Science with a Single Molecule and Single Cell,” plenary lecture and session chair, TEDA 2004 Scanning Probe Microscopy, Sensors and Nanostructures, Beijing, China, May 24, 2004.
317. “The Role of the California NanoSystems Institute (CNSI) and NASA Center on Converging Technologies (CMISE)” National Nanotechnology Initiative, Washington, DC, April 2, 2004.
316. “Nanomechanics of single molecule systems,” American Chemical Society (ACS) National Meeting- Division of Colloid and Surface Chemistry, Anaheim, CA, March 28-April 1, 2004.

- 315. "The Role of Synchrotron Radiation for Nanomaterials Science & Technology. Now and the Future," The 1st Workshop for Joint Program: Japan-US Research Collaboration for Synchrotron Radiation Nanomaterials Science, March 16-17 2004, Tokyo, Japan.
- 314. "Nanoscience: The Role of Mechanics," Distinguished Speaker Series, Santa Monica College, Department of Chemistry & Biochemistry, Santa Monica, CA, March 11 2004.
- 313. "Nano," Docent Lecture, Los Angeles County Museum of Art (LACMA), February 10, 2004.
- 312. "Nanoscience: The Role of Mechanics," Distinguished Speaker Series, Department of Chemistry & Biochemistry California State University, Long Beach (CSULB), , February 4, 2004.
- 311. "Nano," Arts Encounter Program, University of California, Los Angeles, January 21, 2004.
- 310. "Nanoscience with a Single Molecule and Single Cell "Organized Research Combination System (ORCS) International Symposium, Osaka, Japan, January 27, 2004
- 309. "Nanoscience with a Single Molecule and Single Cell" The 20th City University International Forum (YCUIF-20) Science and Technology in nanometer-Scale Materials, Yokohama, Japan, January 25, 2004.

## **2003**

- 308. "Screams of the Molecules: AFM Study," International Workshop on Smart Interconnects (IWSI), Speaker and Co-Organizer with Dr. Rohrer's JSPS Award Workshop, Atami, Japan, November 6-8, 2003.
- 307. "Nanotechnology," Talk of the Nation: Science, National Public Radio (NPR), Panelist, September 26, 2003.
- 306. Seeing at the Nanoscale - An International Conference on Nanostructural Imaging, Characterization and Modification Using SPM and Related Technologies, Session Chair, Veeco/DI, Santa Barbara, CA, August 24-27, 2003.
- 305. "Carbon Versus Silicon: Thinking Small / Thinking Fast," Senior Artist in Residence and Panel Moderator, Electronics and Nanotechnology, Banff Center for the Arts, Banff, Canada, August 6-11, 2003.
- 304. Keynote address, Visionary Forum 2003: Nanotechnology and Beyond - The convergence of technological innovation with the influential creativity of art and design, Jet Propulsion Laboratory, Pasadena, CA, July 22, 2003.

303. “Zero@wavefunction: nano dreams & nightmares,” Nano All Around Us: Technical Conference & Public NanoExpo on Nanotechnology in Our Lives, University of Wisconsin, Madison, May 30-31, 2003.
302. Panel member on “Expert Meeting on Nanotechnology Assessment,” European Academy for the Study of the Consequences of Scientific and Technological Advancement, Groningen, the Netherlands, May 19, 2003.
301. “Nanomechanics,” International Meeting on “NanoScience and Technology,” The Royal Netherlands Academy of Science, Groningen, the Netherlands, May 18-21, 2003.
300. “Nanomechanics Workshop” sponsored by DOE, Lawrence Berkeley Lab and Sandia National Laboratory, Alisomar Study Center, Monterey, CA, May 8-11, 2003.
299. “Nanomechanics” Twelfth Annual Joel G. Hartman Student-Invited Pharmacology Forum – “Advances in Nanotechnology: Solving Large Problems with Tiny Technology,” Vanderbilt University, Nashville, TN, April 24, 2003.
298. “Nanomechanics,” Department of Chemistry, University of Nevada, Reno, April 18, 2003.
297. “Translation of Bimolecular Recognition into Nanomechanical Action,” PITTCON, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, March 10-14, 2003.
296. “Nanotechnology and Infotechnology,” American Association for the Advancement of Science (AAAS) Annual Meeting - “Science as a Way of Life,” Denver, CO February 13-18, 2003.
295. “Using Nanomechanical Responses in Individual Systems from a Single C-C a Bond to Single Cell,” Materials Science Seminar, Department of Chemistry, University of Wisconsin, Madison, January 23, 2003.
294. “Zero@wavefunction: nano dreams & nightmares,” Visualization Portal, University Of California, Los Angeles, January 29, 2003.
293. “Nanomechanics,” Nanotechnology Symposium, Encino-Tarzana Regional Medical Center, Encino, CA, January 20, 2003.

## **2002**

292. “Zero@wavefunction: nano dreams & nightmares” Art & Science Collaborations, ArtSci 2002 International Symposium (in collaboration with the American Museum of Natural History and the Graduate Center of CUNY), New York, NY, December 6-8, 2002
291. “Nanomechanics in Motion” Massachusetts Institute of Technology, MIT, Department of Chemistry, Cambridge, MA, December 5, 2002

290. "Nanomechanics and Complexity" Keynote Speaker, Veeco/Digital Instruments -China Nanotechnology Center Opening, Beijing, China, November 20, 2002
289. "Zero@wavefunction: nano dreams & nightmares" Intel Presentation at the Visualization Portal, University of California, Los Angeles, Los Angeles, CA, November 5, 2002.
288. "Using Nanomechanical Responses in Individual Systems from a Single C-C a Bond to Single Cell" American Vacuum Society (AVS) Science and Technology 49th International Symposium, Denver, CO, November 3-5, 2002
287. "Nanoarchitectonics" International Symposium on NT-BT-IT Fusion Technology, Ministry of Science and Technology (MOST), Seoul, Korea, October 21, 2002
286. Keynote Speaker, "The Economist Innovation Awards Summit" The Economist Magazine Conference Roundtable: Innovation in Nanotechnology, San Francisco, CA, September 18, 2002
285. "Nanotechnology" Institute of Applied Math (IPAM) lecture series, University of California, Los Angeles, Los Angeles, CA September 16-19, 2002
284. "Nanoarchitectonics" Nanoscale and Molecular Mechanics, First International Conference and School, sponsored by Defense Advanced Research Projects Agency (DARPA), National Science Foundation (NSF), California Institute of Technology and ASME Nanotechnology Institute, Maui, Hawaii, May 12 - 17, 2002.
283. "Nanoarchitectonics," Weissberger-Williams Lecture, Eastman Kodak Company, Rochester, New York, April 11, 2002.
282. "Introduction to Nanotechnology," University of California, Los Angeles Extension Short Course , BIO-MEMS, Los Angeles, CA, April 15, 2002.
281. "Nanoarchitectonics," University of California, Los Angeles, California Nanoscience Institute Speaker Series (CNSI), Los Angeles, CA April 17, 2002
280. "Nanoarchitectonics," UCSB, California Nanoscience Institute Speaker Series(CNSI), Santa Barbara, CA, April 5, 2002
279. "Japan Meets the Nano Republic of California," panel member, US-Japan Hi-Tech Partnership, The Japan American Society, Torrance, CA, February 15, 2002.
278. Hewlett-Packard-California Nanoscience Institute Conference, University of California, Los Angeles, February 13, 2002.
277. "Nanoarchitectonics," University of California, Los Angeles, Department of Chemistry, Physical Science Lecture Series, Los Angeles, CA, February 11, 2002.

276. “Molecular Dreams? “The Canadian Institute for Advanced Research (CIAR), Nanoelectronics Winter Workshop on Architecture, Val Morin, Quebec, Canada, February 1, 2002.

## **2001**

275. “Carbon Based Nanoarchitectonics,” Donaghey College of Information Science and System Engineering (DCISSEE) Distinguished Speaker Series, University of Arkansas, Little Rock, November 1, 2001.
274. “From Silicon Sensors to Nanotechnology” BioFinance Round Table, The Wall Street Journal Europe, Dow Jones, Inc., London, September 11, 2001.
273. “Carbon Based Nanoarchitectonics,” Keynote Speaker, TNT 2001 -Trends In Nanotechnology - Segovia, Spain, September 4, 2001.
272. “Nanoarchitectonics” International Business Communications NanoBiotechnology Conference, Keynote Address, San Diego, CA, July 15,2001.
271. “Molecular Electronics and Mechanics” Keynote Speaker, Nano-composants et nano-machines, Observatoire Francais des Techniques Avancée (OFTA), Carre des Sciences, Ministere de la Recherche, Paris, June 6, 2001.
270. “Biological Applications of Nanotechnology” American Chemical Society (ACS) ProSpectives Conference Series, Berkeley, CA, June 2001.
269. “Translation of Biomolecular Recognition into Nanomechanical Action,” Oakridge Conference: “The Post Genome Era: New Targets and New Technologies,” Seattle, WA May 5, 2001.
268. “Nanotechnologies,” Keynote Address, Brave New World Technology Focus, Dresdner, Kleinwort, Wasserstein, London, April 3, 2001.
267. “Molecular Nanoscience in Two and Three Dimensions,” 15th Annual Center for Fundamental Materials Research (CFMR) Symposium, Michigan State University, East Lansing, MI, March 26, 2001.

## **2000**

266. “Nanoscale Machines and Molecular Mechanics” SFC 2000, University de Rennet British Association Annual Festival of Science, 2000. London, England. “M2020 Foresight
265. “Chemistry; The expectations of Industry and the Challenges for Research” Société Francaise de Chimie, November 2000

264. First International Symposium on Nanoarchitectonics using Suprainteraction (NASII) Program, Tsukuba, Japan, November 2000
263. “Nanobiology, Life Extension and the Treatment of Congenital and Degenerative Disease, Life Extension-A Perspective From Nanoscale Science and Technology” Glasgow, Scotland. November 2000.
262. “The Future of Nanoscale Science,” EL.B.A. – Max Planck Forum 2000 Round Table on Nanotechnology and Industrial Development, CNR (National Research Council), Rome, Italy, September 30, 2000.
261. “Translating Biomolecular Recognition into Nanomechanics,” EL.B.A. Satellite Tutorial on Molecular Electronics, Manufacturing and Biotechnology, CNR (National Research Council), Rome, Italy, September 27, 2000.
260. “Nanoscale Science and Technology,” Center of Excellence in Analytical Chemistry, “CEAC” Meeting, Muri, Switzerland, September 21–22, 2000.
259. “Nanoscale Machines and Molecular Mechanics,” French Chemical Society Meeting “SFC 2000,” Rennes, France, September 18–22, 2000.
258. “Molecular Nanotechnology,” SPARKS, Kensington, UK, September 11, 2000.
257. “Nanoarchitectonics Using Suprainteractions” XI International Symposium on Supramolecular Chemistry, July 30-August 4, 2000, Fukuoka, Japan.
256. The Open University, United Kingdom “The Next big Thing” BBC Television, May 2000.
255. International Symposium on Nanoscience and Nanotechnology “Single Molecule Machines, Mechanics and Quantum Electronics” Zichron Ya’akov, Israel May 2000
254. Keynote Speaker, Nanotechnology and Quantum Computing, 3rd International Euspen Conference, May 2000
253. “Molecular Recognition of DNA-Oligomers and Proteins by Functionalized Cantilever Array Sensors,” EMBL Conf. on Scanning Probe Microscopy, Sensors and Nanostructures, Heidelberg, Germany, May 28–31, 2000.
252. “Single-Molecule Machines, Mechanics, and Quantum Mechanics,” Plenary talk, Cotone Congress Genoa, Italy, June 12, 2000.
251. “Nanoelectronics and Molecular Manipulation – Extreme Nanotechnology,” The Royal Institute, London, UK, June 5, 2000.

250. “Molecular-Scale Nanoscience – Latest Developments in Scanning Probe Techniques,” Keynote Lecture, EUSPEN Topical Conf. on Fabrication and Metrology in Nanotechnology, Techn. University of Denmark, Copenhagen, May 30, 2000.
249. “Single-Molecule Machines, Mechanics, and Quantum Electronics,” Int’l Symp. on Nanoscience and Nanotechnology, Zichron Ya’akov, Israel, May 28, 2000.
248. “Single Molecule Machines, Mechanics and Quantum Electronics,” 2nd Royal Soc. of Chemistry Annual Conf. on The Age of the Molecule, Manchester, UK, April 16–20, 2000.
247. “Molecular Rotors,” 2000 AAAS Annual Meeting and Science Innovation Exposition, Washington, DC, February 17–22, 2000.
246. “Cantilever Arrays as Nanomechanical Chemo- and Biosensors,” Single Molecule Conf., University of Linz, Austria, January 29–30, 2000.
245. “SPM Probing of Quantum and Molecular Mechanics of Individual Molecules,” Colloquium, Swiss Fed. Inst. of Technology (ETH) Chemistry Dept., Zurich, Switzerland, January 25, 2000.

## **1999**

244. “STM Probing of Quantum and Molecular Mechanics of Individual Molecules” MRS Fall Meeting, Symposium H: Molecular Electronics, November 29–December 2, 1999.
243. H.P. Lang, M.K. Baller, J. Fritz, Ch. Gerber, J.K. Gimzewski, “Nanomechanical Cantilever Sensors,” Nanotechnology Symp., Basel Canton Hospital, Basel, Switzerland, November 12, 1999.
242. “Cantilever Array-Based NOSE and Biosensor,” McGill University, Montreal, Canada, November 8, 1999.
241. “Cantilever Array-Based NOSE and Biosensor,” MIT Media Lab, Boston, MA, November 4, 1999.
240. “Nanoscale Science and Technology: A Molecular Approach,” Conf. on Electron and Electromagnetic Field in Nanometer Structures, Tsukuba, Japan, October 27–29, 1999.
239. “Frontiers: Nanoscale Science of Single Molecules,” Plenary talk, 1st Int’l Symp. Electron and Electromagnetic Fields in Nanometer-Scale Structures, Tsukuba, Japan, October 27–29, 1999.
238. “Bottom-Up Nanomachines (BUN)” Swiss-US Forum on Nanoscale Science and Nanotechnology “NanoForum CH-US ‘99,” Zurich, Switzerland, September 20–22, 1999.

237. "A Chemical Nose Based on Nanomechanics" 5th Anniversary of Center for Chemical Sensors (CCS) "Senslab '99," Zurich, Switzerland, September 17, 1999.
236. "Designer Molecules, Nanomechanics and Nanoelectronics" European Conf. on Molecular Electronics "ECME '99," Linköping, Sweden, September 8–11, 1999.
235. "Mechanics and Electronics of Single Molecules," Colloquium on Nano Science and Nano Technology –The Impact of Scanning Probe Microscopy, Institute of Physics, Basel, Switzerland, August 27, 1999.
234. "NOSE Experiments II," CASTELEN-Nanoscience Seminar, Augst, Switzerland, August 23, 1999.
233. "NOSE Experiments," CASTELENNanoscience Seminar, Augst, Switzerland, August 23, 1999.
232. "Exploring the Mechanics and Electronics of Single Molecules Using SPM," Volkswagen Foundation Symp. on New Trends in Physics, Chemistry, and Biology with Single Molecules, Wiesbaden, Germany, July 14–16, 1999.
231. "Working on Designer Molecules from the Outside and the Inside," 6th Int'l Conf. on Structures on Surfaces "ICOS," University of British Columbia, Vancouver, Canada, July 26–30, 1999.
230. "Versatile Si Sensors for the Nano Scale," Int'l EMBO Workshop (European Molecular Biology Organization) on Single Molecule Biophysics, Tours, France, July 8–15, 1999.
229. "A Cantilever-Array- Based Artificial Nose," University of California at Berkeley, Berkeley, CA, June 7, 1999.
228. "A Cantilever-Array- Based Artificial Nose," Stanford Univ., CA, June 4, 1999.
227. "A Cantilever-Array- Based Artificial Nose," IBM Almaden Research Center, San Jose, CA, June 3, 1999.
226. "A Cantilever Array Based Artificial Nose," Scanning Probe Microscopy, Cantilever Sensors, and Nanostructures Conf., Seattle, WA, May 30–June 1, 1999.
225. "Nanoscale Science of Individual Molecules," Workshop on the Dynamics of Nanostructures, under the auspices of the CNRS, the Laboratoire Aimé Cotton and the Int'l Research Chair Blaise Pascal, Gif-sur- Yvette, France, March 11–12, 1999.
224. "An Artificial NOSE Based on AFM Technology," Winter Workshop and Roundtable on Advances in Force Microscopy and Spectroscopy with Bioprobes, Johannes Kepler Univ., Linz, Austria, January 31–February 2, 1999.

- 223. “New Applications Based on MEMS,” Plenary talk, 12th IEEE Int’l Conf. on Micro Electro Mechanical Systems “MEMS ‘99,” Orlando, FL, January 17–21, 1999.
- 222. “The Nanomechanical NOSE,” 12th IEEE Int’l Micro Electro Mechanical Systems Conf., “MEMS ‘99,” Orlando, FL, January 17–21, 1999.
- 221. “Transduction Principles and Applications of Micromechanical Sensors for Femtoscale Science,” Symp. of NSR and RIM Research Schools, Nijmegen, The Netherlands, January 13–14, 1999.
- 220. “Transduction Principles and Applications of Micromechanical Sensors for Femtoscale Science,” Inst. of Physics, Univ. of Augsburg, Germany, January 11, 1999.

## 1998

- 219. “Working with Individual Designer Molecules from the Inside and the Outside,” Richard B. Bernstein Memorial Lecture, University of California, Los Angeles, CA, November 23, 1998.
- 218. “Engineering with Single Molecules. Architectures of Tomorrow,” 8th Annual Pittsburgh Conference Lectures, Dept. of Chemistry, University of Pittsburgh, PA, February 5, 1998.
- 217. “Exploring Nano, Femto, Pico and Atto Using Micromechanics and Nanoscale Science,” 8th Annual Pittsburgh Conference Lectures, Dept. of Chemistry, University of Pittsburgh, PA, February 4, 1998.
- 216. “External and Internal Manipulation of the Mechanics and Electronics of Single Molecules,” Plenary talk, Institute of Physics Int’l Symposium: Condensed Matter and Material Physics (CMMP ‘98) Univ. of Manchester, Institute of Physics, Manchester, UK, December 21, 1998.
- 215. “Microelectronics and Nanoelectronics,” Scuola Avanzata SIME, Microscopie a Scansione di Sonda (Italian Microscopy Society), Firenze, Italy, December 11, 1998.
- 214. “Nanotechnology with the SPM,” The Cambridge Philosophical Society, Cavendish Laboratory, Cambridge, UK, December 7, 1998
- 213. “Working with Designer Molecules from the Outside and the Inside,” NAIST Int’l Symposium on Nano/Biotechnology, Nara, Japan, November 25–26, 1998.
- 212. “Mechanics and Electronics of Simple Molecules” Academy of Sciences France, Nanoscience Seminar, DEA SACLAY, France, November 18, 1998.
- 211. “An Artificial Nose Based on a Micromechanical Cantilever Array,” Euroanalysis 10 Conf., Basel, Switzerland, September 6–11, 1998.

210. "Micromechanical Devices as Ultra-Sensitive Sensors," Plenary talk, ISAF-ECAPD Electroceramics '98, Montreux, Switzerland, August 25, 1998.
209. "Manipulation of Nanoscale Objects by STM: From Atoms to Complex Molecules," Int'l Conf. on the Interaction of Surfaces with Ions, Atoms and Molecules, Bombannes, France, May 25–29, 1998.
208. "NOSE: A Synthesis of Micro and Nano Systems Technology," 2nd Annual MINAST Convention (Swiss Priority Program in Micro and Nano System Technology), Bern, Switzerland, April 29, 1998.
207. "Transduction Principles and Integration of Chemical Sensors into a Micromechanical Array Device," Dutch Sensor Conf. 1998, Enschede, The Netherlands, March 2–3, 1998.
206. "Micromachined Sensor Arrays Based on Mechanical Transduction of Chemical Processes," 28th Int'l Symp. on Environmental Analytical Chemistry (ISEAC 28), Geneva, Switzerland, March 1–5, 1998.
205. "Molecules in Electromagnetic Cavities Driven Through Inelastic Tunneling: Communication on the Nanoscale," 3rd Int'l Symp. on Advanced Physical Fields "APF-3," Tsukuba, Japan, February 18–20, 1998.
204. "Exploring the External and Internal Mechanics and Electronics of Single Molecules," Nanofab Meeting, Technical University of Denmark, Lyngby, Denmark, February 16–17, 1998.
203. "Nanomechanics and Nanochemistry of Individual Molecules," Vaude Society of Natural Sciences (SVSN), Lausanne, Switzerland, January 21, 1998.
202. "Mechanical and Electronic Properties of Designer Molecules Towards Nanoelectronics," (1) Institute of Physics, Univ. Zurich; (2) Institute of Solid-State Physics, Swiss Federal Inst. of Technol. (ETH), Zurich, Switzerland, November 11–13, 1998.
201. "Molecular Wheel," Science Media Day at IBM Research, Yorktown Heights, NY, November 11, 1998.
200. "Communications on the Nanoscale Using Electromagnetic Modes as Medium," Nat'l Research Inst. for Metals (NRIM), Tsukuba, Japan, November 3, 1998.
199. "Designing Molecules for Nanoelectronics," RWTH Aachen, Physics Institute II, Aachen, Germany, September 24, 1998.
198. "A Chemical Sensor Based upon a Micromechanical Array Device," CSEM, Zurich, Switzerland, May 5, 1998.

197. "Transduction of Physical and Chemical Effects into a Micromechanical Response," Univ. of Nijmegen, The Netherlands, March 5, 1998.
196. "Transduction Principles and Applications of Micromechanical Cantilever Sensors for Femtoscale Science," Paul Scherrer Institute (PSI), Villigen, Switzerland, February 10, 1998.

## 1997

195. "Single-Molecule Mechanics: Towards an Electronic Circuit Operating in a Tunnel Junction," Engineering Foundation Conf. on Molecular Dynamics: Science and Technology, Humacao, Puerto Rico, December 14–18, 1997.
194. "Is There a Minimum Size and a Maximum Speed for a Nanoscale Molecular Amplifier?," Engineering Foundation Conf. on Molecular Dynamics: Science and Technology, Humacao, Puerto Rico, December 14–18, 1997.
193. "Visualization, Manipulation, and Verification of Molecular Mechanical Operations on Individual Molecules," 5th Foresight Conf. on Molecular Nanotechnology, Palo Alto, CA, November 5–8, 1997.
192. "Exploring the External and Internal Mechanics of Molecules," 18th SPM Workshop, Cologne, Germany, October 7, 1997.
191. "Room Temperature Molecular Recognition and Manipulation on an Individual Basis," Annual Meeting of German Physical Society (DPG), University of Regensburg, Germany, September 7, 1997.
190. "Molecular Manipulation, Recognition, and Conformational Identification Using Scanning Tunneling Microscopy," 36th Int'l Congress of the Int'l Union of Pure and Applied Chemistry "IUPAC," Geneva, Switzerland, August 17–22, 1997.
189. "Micromechanical Array Sensors," 9th Int'l Conf. on Scanning Tunneling Microscopy/Spectroscopy and Related Techniques "STM '97," Hamburg, Germany, July 20–25, 1997.
188. "Understanding and Utilizing the Internal and External Mechanics of Individual Molecules," 1st Int'l Symp. on Scanning Probe Spectroscopy and Related Methods "SPS '97," Poznan, Poland, July 15–18, 1997.
187. "Assembly of Molecular Nanostructures and Exploration of Simple Functions," STM-Based Lithography and Atomic Electronics, Trieste, Italy, July 15–18, 1997.
186. "Nanomechanics of Individual Molecules," Symp. Molecular Nanostructures and Low-Dimensional Systems at Interfaces, Max Planck Inst. for Fluid Dynamics, Göttingen,

Germany, July 3-4, 1997.

185. "Micromechanics: A Toolbox for Femtoscale Science," ETH Technopark, Center for Chemical Sensors, Zurich, Switzerland, June 10, 1997.
184. "Scanning Probe Microscopy – State of the Art and Future Applications," 9th Int'l Precision Engineering Seminar and 4th Int'l Conf. on Ultra Precision Manufacturing Engineering, Braunschweig, Germany, May 26–30, 1997.
183. "Molecular Manipulation on Surfaces," NATO Forum on Nanoscale Science and Technology, Toledo, Spain, May 11–16, 1997.
182. "Manipulation of Molecules, Conformation and Repositioning of Medium Complex Molecules," Symp. on Structure and Function of Cell Surface Proteins, DFG Research Group on Biology, Univ. of Constance, Germany, May 9, 1997.
181. "Mechanical and Electronic Manipulation of Individual Fullerenes," 191st Meeting of the Electrochemical Society (ECS), Montreal, Canada, May 1997.
180. "Squeezing Buckies and Beyond," RQI Seminar, Rice Univ., Houston, TX, April 25, 1997.
179. "Molecular Manipulation, Recognition, and Conformational Identification Using Scanning Tunneling Microscopy," STM–AFM–SNOM: New Nanotools for Molecular Biology, Royaumont, France, April 16–18, 1997.
178. "Seamless Micromechanical Sensor Array," 1st MINAST Convention (Swiss Priority Program in Micro and Nano System Technology), Bern, Switzerland, April 9, 1997.
177. "Nanomechanics of Single Molecules," European Workshop on Microtechnology and Scanning Probe Microscopy, Mainz, Germany, April 7-9, 1997.
176. "Nanofabrication of Supramolecular Structures at Room Temperature Using the Bottom–Up Approach," Phantoms Strategic Domain Meeting, Physics and Technology of Mesoscopic Systems "PHASDOM '97," Aachen, Germany, March 10-13, 1997.
175. "Manipulation of Individual Molecules," Gordon Conf. on Chemical Reactions on Surfaces, Ventura, CA, February 18-21, 1997.
174. "Silicon Micromechanical Sensors: At the Ultimate Limit of Sensitivity," 2nd Italian Conf. on Sensors and Microsystems, Rome, Italy, February 3-5, 1997.
173. "Molecular Structures and Their Properties at Interfaces: Sciengineering from the Bottom Up," Physics–Chemistry Colloquium, Swiss Federal Inst. of Technology (ETH) Zurich, Switzerland, January 28, 1997.

172. "Highlight of Scanning Probe Techniques," 169th WE Heraeus Seminar on New Nanostructures below 100 nm: Perspectives and Applications, Bad Honnef, Germany, January 27-30, 1997.
171. "Bottom up Approach to Nanofabrication," 169th WE Heraeus Seminar on New Nanostructures below 100 nm: Perspectives and Applications, Bad Honnef, Germany, January 27-30, 1997.
170. "Nanofabrication of Supramolecular Structures at Room Temperature Using the Bottom-Up Approach," Inst. d'Electronique de Microélectronique du Nord (IEMN-ISEN), UMR-CNRS, Lille, France, July 8, 1997.
169. "Micromechanics: Measuring Nanonewtons, Picograms, Femtojoules, Attoliters and Zeptomols in Milliseconds," Technical Univ. of Munich, Germany, May 5, 1997.
168. "Molecular Mechanics and Molecular Electronics of Porphyrin-Based Nanostructures," Inst. of Chemistry, Univ. of Fribourg, Switzerland, March 20, 1997.
167. "Manipulation of C60 Molecules Adsorbed on Surfaces Using the Scanning Tunneling Microscope," IBM T.J. Watson Research Center, Yorktown Heights, NY, March 14, 1997.
166. "Room Temperature Repositioning of C60 Molecules on Surfaces with the STM," Swiss Federal Inst. of Technology (EPFL), Lausanne, Switzerland, February 14, 1997.
165. "Molecular Mechanics and Molecular Electronics of Single Interfaced Molecules: Is There a Bottom-Up Approach to Technological Functions?," Univ. of Stuttgart, Germany, February 3, 1997.
164. "STM Manipulation of C60 Molecules on Surfaces at Room Temperature," Notre-Dame de la Paix Univ., Namur, Belgium, January 23, 1997.
163. "Micromechanics: A Toolbox for Femtoscale Science," Univ. of Münster, Germany, January 17, 1997.
162. "Manipulation of C60 Molecules Adsorbed on Surfaces Using the STM," Centre Nat'l de Recherche et Sciences (CNRS), Marseille, France, January 16, 1997.

## 1996

161. "Positioning of Molecules at Room Temperature: The Role of Molecular Flexure and Motion," Schoessmann Seminar on Nanostructures in Biology, Chemistry and Physics, Schloss Elm, Germany, Dec. 9-11, 1996.
160. "Expanding Molecular Architectures and Shrinking Micromechanical Constructions on an Individual Basis," Japanese-Swiss Science Seminar: Nanoscience-The Impact of

- Scanning Probe Microscopy, Ascona, Switzerland, Dec. 2-4, 1996.
159. "Molecular Flexure and Motion Induced in Molecules Using STM," Int'l Riken Symp. on Atomic Scale Sci-engineering in Surfaces and Interfaces, Wako, Japan, Nov. 11-13, 1996.
  158. "Molecular Dynamics in Action," 10th Toyota Conf. on Atomic, Molecular and Electronic Dynamic Processes on Solid Surfaces, Shizuoka, Japan, Nov. 5-8, 1996.
  157. "Scanning Tunneling Microscopy of Individual Molecules: Beyond Imaging" 10th Toyota Conf. on Atomic, Molecular and Electronic Dynamic Processes on Solid Surfaces, Shizuoka, Japan, Nov. 5-8, 1996.
  156. "Manipulation of Atoms and Molecules on Surfaces Using an STM Tip" 10th Toyota Conf. on Atomic, Molecular and Electronic Dynamics Processes on Solid Surfaces, Shizuoka, Japan, Nov. 5-8, 1996
  155. "Positioning Individual Molecules at Room Temperature" Nanotechnology Forum 1996, Munich, Germany, Oct. 9-11, 1996.
  154. "Scanning Tunneling Microscopy at Room Temperature" NATO ARW on Nanowires, Miraflores, Spain, Sept. 23-27, 1996.
  153. "Micromechanics: A Toolbox for Femtoscale Science: 'Towards a Laboratory on a Tip' " Int'l Conf. on Micro- and Nano Engineering "MNE '96," Glasgow, UK, Sept. 23-25, 1996.
  152. Series of Lectures for Students: (1) Introduction to Methods for Electron Transfer in STM (2) Methods to Study Electron Transfer Processes (3) Electron Transport in Molecules (4) Dissipative Processes (5) Open Questions and Current Issues under Debate (6) New Directions in Phenomena and Fabrication Intercantonal Swiss-French Convention for the Teaching of Chemistry in the 3rd Cycle, Lac Noir, Switzerland, Sept. 16-20, 1996.
  151. "Mechanisms for Sliding Friction of Single Molecules Using Scanning Tunneling Microscopy at Room Temperature" NATO ASI on Micro/Nanotribology and Its Applications, Vilas de Sesimbra, Portugal, June 16-28, 1996.
  150. "Translation of Individual Molecules Across Surfaces Using STM: Role of Molecular Flexing, Deformations and Translations" NATO ASI on Micro/Nanotribology and Its Applications, Vilas de Sesimbra, Portugal, June 16-28, 1996.
  149. "Nanomechanics of Individual Molecules: Repositioning and Fabrication" Nanometer Structure Consortium Colloquium, Lund, Sweden, May 24, 1996.
  148. "Tip-Molecule Interactions: Distortion, Controlled Translation and Molecular Rupture"

- Minisymposium on Molecules for Advanced Materials and Nanostructures, H.C. Orsted Inst., Copenhagen, Denmark, May 23, 1996.
147. "Molecular Manipulation" Annual Nat'l Micronics Meeting (NUTEK), Ystad, Sweden, May 22, 1996.
  146. "Structure and Function of Molecules at Surfaces: Concepts for Molecular Performance at the Bottom" Nano-Meeting, Augst, Switzerland, May 13-14, 1996.
  145. "Nanomechanics of Individual Molecules in STM: Deformation, Conformation, and Controlled Translational Assembly" Workshop on Nanoscale Science with Scanning Probe Techniques, Max-Planck-Inst. für Festkörperforschung, Stuttgart, Germany, May 8, 1996.
  144. "Contacting Molecular Nanostructures: Molecular Mechanics, Charge Transfer and Transport Properties" NATO ARW on Atomic and Molecular Wires, Les Houches, France, May 6-10, 1996.
  143. "Fullerenes @ Fullerenes: Probing and Manipulation of Individual Molecules" 189th Meeting of the Electrochemical Soc. (ECS), Los Angeles, CA, May 5-10, 1996.
  142. "Molecular Manipulation," Europhysics Industrial Workshop on Nanoscale Science and Technology, Birmingham, UK, April 15-16, 1996.
  141. "Tip-Molecule Interaction," Symp. on Tip-Surface Interactions, Cambridge, UK, April 18-19, 1996.
  140. "Controlled Positioning of Molecules at Room Temperature: The Role of Molecular Flexure and Motion," 1st Int'l Symp. on Advanced Physical Fields, Tsukuba, Japan, March 25-27, 1996.
  139. "Bottom-Up Fabrication of Supramolecular Structures at Room Temperature," 1st Int'l Symp. on Advanced Physical Fields, Tsukuba, Japan, March 25-27, 1996.
  138. "Concepts for the Formation of Molecular Nanostructures: Self-Assembly and Manipulation: A Combined Approach," American Physical Soc. Meeting, St. Louis, MO, March 18-22, 1996.
  137. "The Pains and Pleasures of Complexity and Reductionism," Soka Gakkai Int'l Human Club, Tsukuba, Japan, March 18, 1996.
  136. "Initial Plasma Oxidation Kinetics of Silicon and Surface Potential Change," Int'l Symp. on Materials Chemistry in Nuclear Environment, "MC '96," Tsukuba, Japan, March 14-15, 1996.
  135. "Repositioning of Individual Molecules at Room Temperature," Int'l Symp. on Materials

Chemistry in Nuclear Environment, "MC '96," Tsukuba, Japan, March 14-15, 1996.

134. "Nanomanipulation in the Scanning Tunneling Microscope" Conf. on Carbon Nanotubes and other Nanoparticles, Namur, Belgium, Feb. 8, 1996. 133. "Attograms, Femtojoules, Picometers Chemical Sensing with Nanomechanics" Gordon Research Conf. on Bioanalytical Sensors, Oxnard, CA, Jan. 14-19, 1996.
132. "Micromechanics: A Toolbox for Femtoscale Science: 'Towards a Laboratory on a Cantilever' " Oak Ridge Nat'l Laboratory, Oak Ridge, TN, Dec. 2, 1996.
131. "Probing and Manipulating Individual Molecules at the Ultimate Limits of Fabrication and Measurement" Dept. of Physics, Univ. of Constance, Germany, Nov. 29, 1996.
130. "Micromechanics: A Toolbox for Femtoscale Science: 'Towards a Laboratory on a Cantilever' " Univ. of Nebraska, Lincoln, NB, Nov. 26, 1996.
129. "Micromechanics: A Toolbox for Femtoscale Science: 'Towards a Laboratory on a Cantilever' " Naval Research Laboratory, Washington, DC, Nov. 25, 1996.
128. "Single Molecules: Repositioning and Amplifiers" Nat'l Inst. for Metals (NRIM), Tsukuba, Japan, Nov. 11, 1996.
127. "Tuning Molecular Properties: Conformation, Stability of Adsorption, Dynamics and Charge Transfer" Swedish Royal Inst. of Technology, Kista, Sweden, Aug. 19, 1996.
126. "One Dimensional Metal Structures at Decorated Steps: A Model System for Spectroscopy" Physics Inst. II, Technical Univ. of Aachen (RWTH), Germany, July 12, 1996.
125. "Supra Molecular Assembly Processing" Univ. of Stuttgart, Germany, July 2, 1996.
124. "Molecular Nanostructures from Porphyrins: A Model System for Nanotechnology?" EPFL, Lausanne, Switzerland, April 9, 1996.
123. "Building 'Structures' and 'Functions' from Individual Porphyrin Molecules at Surfaces" McGill Univ., Montreal, Canada, March 15, 1996.

## **1995**

122. "Building 'Structures' and 'Functions' from Individual Molecules" Univ. of Lausanne, Switzerland, Jan. 9, 1996. 1995
121. "Scanning Probe Methods in Industrial Research" Plenary lecture at the information meeting on Nanotechnology for Industry and Applied Research of the Swiss Soc. of Nanotechnology (SGNT), Neuchâtel, Switzerland, Nov. 27, 1995.
120. "Manipulation of Molecules at Room Temperature" 19<sup>th</sup> Gwatt Workshop on

- Nanophysics, Gwatt, Switzerland, Oct. 5-7, 1995.
119. "Limits of Spatial and Spectral Resolution in Photon Emission from STM" 15th European Conf. on Surface Science "ECOSS-15," Lille, France, Sept. 4-8, 1995.
  118. "Round Table Discussion on STM" with R. Wiesendanger European Science Foundation Programme on Artificial Biosensing Interfaces, Summer School on Modern Characterization Techniques for Thin Molecular Films and Immobilized Biomolecules, Uppsala, Sweden, June 30 – July 2, 1995.
  117. "Scanning Tunneling Microscopy of Large Molecular Systems: From Individual Molecules to Multilayers" European Science Foundation Programme on Artificial Biosensing Interfaces, Summer School on Modern Characterization Techniques for Thin Molecular Films and Immobilized Biomolecules, Uppsala, Sweden, June 30 – July 2, 1995.
  116. "Scanning Tunneling and Local Probe Studies of Fullerenes" NATO ARW on The Chemical Physics of Fullerenes 10 (and 5) Years Later, Varenna, Italy, June 12-16, 1995.
  115. "Introduction to SPM" 8th Int'l Precision Engineering Seminar, Compiègne, France, May 15-19, 1995.
  114. "Atomic Force Microscopy (AFM) / Scanning Tunneling Microscopy (STM)" European Microbeam Analysis Soc. 4th European Workshop on Modern Developments and Applications in Microbeam Analysis, Microbeam and Nanobeam Techniques, "EMAS '95," St. Malo, France, May 14-19, 1995.
  113. "Photothermal Spectroscopy with Femtojoule Sensitivity Using a Micro-Mechanical Device" 3rd Int'l Conf. on Near-Field Optics and Related Techniques "NFO-3," Brno, Czech Republic, May 9-11, 1995.
  112. "STM of Fullerene and Porphyrin Molecule" NATO ARW on Nanoscale Science "Chemical, Structural and Electronic Analysis of Heterogeneous Surfaces on Nanometer Scale," Trieste, Italy, April 24-26, 1995.
  111. "Microcalorimeter and Chemical Sensor" Int'l Symp. on Ultra Materials for Picotransfer, Chiba, Japan, March 22-25, 1995.
  110. "The Single Molecule Resistor" Int'l Symp. on Ultra Materials for Picotransfer, Chiba, Japan, March 22-25, 1995.
  109. "Contact and Tunneling Processes of Fullerene Molecules in a Nanoscopic Cavity" IMR Workshop, Tohoku Univ., Japan, March 3, 1995.
  108. "Micromechanical Heat Sensors" Group Seminar and Discussion Group, Nat'l Res. Inst. for Metals, Tsukuba, Japan, Feb. 28, 1995.

107. "Nano–Metres, Pico–Watts and Femto–Grammes: Nanoscale Science" Nanotechnology Research Group Meeting, Univ. of Glasgow, Scotland, Jan. 17, 1995.
106. "Molecular Nanostructures: Design and Properties" Paul Scherrer Inst., Zurich, Switzerland, Nov. 30, 1995.
105. "Molecular Nanostructures of Individual Molecules: Fabrication Methods and Properties" Univ. of Hamburg, Germany, Nov. 23, 1995.
104. "The Combination of Chemistry and Physics for the Assembly of Molecular Nanostructures" Imperial College, London, UK, Nov. 17, 1995.
103. "Molecular Nanostructures: The Interrelationship of Design and Properties from Studies of Porphyrin–Based Molecules" Paul Scherrer Inst., Villigen, Switzerland, Oct. 24, 1995.
102. "One–Dimensional Metal Structures at Decorated Steps: A Model System for Spectroscopy" Univ. of Basel, Switzerland, Oct. 23, 1995.
101. "STM Studies of Fullerenes" Nat'l Research Inst. for Metals, Tsukuba, Japan, March 16, 1995.
100. "Scanning Tunneling Microscope Studies of Molecules and Local Probes" Mezo Material Research Center, Kyoto Univ., Japan, March 14, 1995.
99. "Electrical Contact of Fullerenes in a Nanoscopic Cavity: Elastic and Inelastic Interactions" Advanced Research Laboratories, Hitachi Ltd., Saitama, Japan, March 7, 1995.
98. "Photon Emission Processes in STM" National Research Inst., Tsukuba, Japan, March 6, 1995.
97. "Molecules in Nanoscopic Cavities" Aono Atomcraft Project, Riken, Japan, March 1, 1995.

## **1994**

96. "Scanning Tunneling Microscopy: Some Recent Applications" IFF Colloquium, Nuclear Research Center (KFA), Jülich, Germany, Nov. 18, 1994.
95. "Micromechanical Calorimeter: Hardware for NOSE on Chip" Olfaction and Electronic Nose Symp., Toulouse, France, Sept. 26-27, 1994.
94. "Photon Emission from STM: Concepts" NATO ARW on Photons and Local Probes, Reichenau, Germany, Sept. 11-17, 1994.

93. "Structural and Electronic Characterization of Fullerenes on Metallic Surfaces Investigated with STM" Fall 1994 Center for Solid State Science Special Seminar, Arizona State Univ., Tempe, AZ, Aug. 9, 1994.
92. "Scanning Tunneling Microscopy of Ordered C<sub>60</sub> Layers on Au(111), Cu(111), Ag(110) and Au(110) Surfaces" Session Chairman of "Materials" and invited speaker at the European Colloquium on Near-Field Microscopy, Dijon, France, June 23-25, 1994.
91. "Contacting a Single C<sub>60</sub> Molecule" NATO ARW on Scanning Probe Microscopies and Molecular Materials, Schloss Ringberg, Germany, May 29 – June 3, 1994.
90. "Scanning Tunneling Microscopy" Int'l Congress on Atomic Scale Control of Surfaces and Interfaces, Brighton, UK, April 11-14, 1994.
89. "Micromechanical Calorimeter with Picojoule-Sensitivity" NATO ARW on The Ultimate Limits of Fabrication and Measurement, Cambridge, UK, April 5-8, 1994.
88. "STM Studies of C<sub>60</sub> Induced Structures on TiO<sub>2</sub> (100) 1×3 3" 10th Interdisciplinary Surface Science Conf. "ISSC-10," Liverpool, UK, March 28-31, 1994.
87. "Photon Emission Spectroscopy and Microscopy Using Scanning Tunneling Microscopy: Metals, Semiconductors, Oxides and Molecules," 14th General Conf. of the EPS Condensed Matter Division "GCCMD-14," Madrid, Spain, March 28-31, 1994.
86. "Atomically Resolved Photon Emission from the Au(110) Surface with a Scanning Tunneling Microscope (STM)" Swiss Physical Soc. Spring Meeting, Bern, Switzerland, March 17-18, 1994.
85. "Observation of a Chemical Reaction Using a Micromechanical Sensor" NATO ASI on Forces in Scanning Probe Methods, Schluchsee, Germany, March 7-18, 1994.
84. "Adsorbate Dynamics and New Electronic Properties: Monolayer Heteroepitaxial Growth on Metallic Surfaces" Univ. of Hamburg, Germany, Nov. 25, 1994.
83. "Micromechanical Calorimeter and Chemical Sensor" Firmenich SA, Geneva, Switzerland, Nov. 17, 1994.
82. "STM in Zurich" Dept. of Pure and Applied Physics, Queen's Univ. of Belfast, N. Ireland, June 14, 1994.
81. "Micromechanical Chemical Sensor" Inst. for Quantum Electronics, ETH, Zurich, Switzerland, April 29, 1994.
80. "Growth and Epitaxy of Fullerenes on Metal and Oxide Surfaces" Free Univ. of Berlin, Germany, Jan. 28, 1994.

## 1993

79. "Light Emission Induced by the Tip of an STM: Metals, Semiconductors and Molecules" Joint Seminar, Dept. of Synchrotron Radiation Research and Dept. of Solid-State Physics, Univ. of Lund, Sweden, Aug. 31, 1993.
78. "Low-Temperature Scanning Tunneling Microscopy" 20th Int'l Conf. on Low-Temperature Physics "LT-20," Eugene, OR, Aug. 4-11, 1993
77. "C60 Adsorption on Metals: Geometric Structure, Electronic Structure, Vibrational Spectra and Charge Transfer" 3rd FICH Workshop on Aggregates Support, L'Aquila, Italy, June 21-23, 1993.
76. "Scanning Tunneling Microscopy" European Conf. on Advanced Materials and Processes "EUROMAT '93," Paris, France, June 7-10, 1993.
75. "New Reconstructions of Au Surfaces Induced by C60 Adsorption" 4th European Conf. on Surface Crystallography, Aarhus, Denmark, May 23-26, 1993.
74. "Scanning Tunneling Microscopy of Ordered C60 Layers on Au(111), Cu(111), Ag(110) and Au(110) Surfaces" Joint Seminar of the Surface Reaction and Physical Chemistry Depts., Fritz Haber Inst. of the Max Planck Soc., Berlin, Germany, April 21, 1993.
73. "Photon Emission from Adsorbed C60 Molecules with Sub-Nanometer Lateral Resolution" German Physical Soc. Spring Meeting on Solid-State Physics, Regensburg, Germany, March 29 – April 2, 1993.
72. "STM Studies of C60 Covered Au(110) Surfaces at Low Temperatures" Spring Meeting of the Swiss Physical Soc., Neuchâtel, Switzerland, March 24-26, 1993.
71. "Photon Emission from STM Studied on C60 Covered Au(110) Surfaces at Low Temperatures" Spring Meeting of the Swiss Physical Soc., Neuchâtel, Switzerland, March 24-26, 1993.
70. "Topography, Light Emission and Nanostructuring of 85% Porous Silicon Using STM" Paul Scherrer Inst., Zurich, Switzerland, Sept. 27, 1993.

## 1992

69. "Growth of Ordered Layers of C60 on Noble Metals" 17th Annual Meeting on Advances in Surface and Interface Physics, Modena, Italy, Dec. 16-18, 1992.
68. "Electrical Communication and Coupling at Nanometer Distances: Inelastic Tunneling Excitation of Coupled Electromagnetic Modes" Condensed Matter Colloquium, Philips Research Laboratory, Eindhoven, The Netherlands, Nov. 11, 1992.

67. "Optical Spectroscopy and Microscopy Using Scanning Tunneling Microscopy" NATO ARW on Near Field Optics, Besançon, France, Oct. 26-28, 1992.
66. "Optical Microscopy and Spectroscopy Using Scanning Tunneling Microscopy" 16th Int'l Seminar on Surface Physics, Wrocław, Poland, Oct. 5-10, 1992.
65. "Local Experimentation on Fullerenes: Present and Future Research" Mini Workshop on Fullerenes, Zurich Research Laboratory, Rüschlikon, Switzerland, Oct. 2, 1992.
64. "Injection Luminescence from CdS Studied with Scanning Tunneling Microscopy" Workshop on Photons and Scanning Probe Microscopies, Constance, Germany, July 20-22, 1992.
63. "Photon Emission from the Scanning Tunneling Microscope" Workshop on Photons and Scanning Probe Microscopies, Constance, Germany, July 20-22, 1992.
62. "Local Experiments Using Nanofabricated Structures in STM" NATO ARW on Manipulations of Atoms under High Fields and Temperatures: Applications, Lyon, France, July 6-10, 1992.
61. "The Role of STM in Surface Science" Lecture Series, Sincrotrone Trieste Società Consortile per Azioni, and Laboratorio TASC Consorzio INFN Fisica della Materia, Trieste, Italy, May 6, 1992.
60. "Experimental Aspects of STM in UHV: Fundamental Considerations" Lecture Series, Sincrotrone Trieste Società Consortile per Azioni, and Laboratorio TASC Consorzio INFN Fisica della Materia, Trieste, Italy, May 5, 1992.
59. "Low-Temperature Ultra-High-Vacuum Scanning Tunneling Microscope" Inst. of Physics Meeting, Soc. of Chemical Industry, London, UK, Feb. 27, 1992.
58. "STM Studies of C<sub>60</sub> Adsorbed on Noble Metal Surfaces" Dept. of Physics, Univ. Aix II, Marseille, France, Sept. 22, 1992.
57. "Photon Emission Studies Using STM" Dept. of Physics, Univ. Aix II, Marseille, France, Sept. 22, 1992.
56. "Address to the Faculty for the Defense of the Thesis of F. Jensen" Inst. of Physics and Astronomy, Aarhus Univ., Denmark, Sept. 4, 1992.
55. "Photon Emission Processes in STM" Inst. of Physics and Astronomy, Aarhus Univ., Denmark, Sept. 4, 1992.
54. "STM Studies of C<sub>60</sub> Adsorbed on Metal Surfaces" Inst. of Physics and Astronomy, Aarhus Univ., Denmark, Sept. 3, 1992.

## 1991

53. “Molecular Level Imaging: New Scanning Techniques” The Inst. of Physics Corporate Affiliates Annual Conf., ICI Wilton Materials Research Center, Wilton, UK, Nov. 28-29, 1991.
52. “Scanning Tunneling Microscopy in Materials and Surface Physics” Physics and Applied Physics Research Colloquium, Univ. of Strathclyde, Scotland, Nov. 25, 1991.
51. “Aspects of Photon Emission from Metallic Surfaces in the Scanning Tunneling Microscope” Int’l Symp. on STM, Chemnitz, Germany, Nov. 12-14, 1991.
50. “Local Photon Emission Processes in STM” French–Iberian Colloquium on Electronic Microscopy “CFIME,” Barcelona, Spain, July 2-5, 1991.
49. “Light Emission from the STM” 74th WE Heraeus Seminar, Bad Honnef, Germany, March 4-6, 1991.
48. “Photon Emission Processes in STM” Int’l Conf. on Scanned Probe Microscopies: STM and Beyond, Santa Barbara, CA, Jan. 6-11, 1991.
47. “Electrical Communication and Coupling at Nanometer Distances: Inelastic Electron Tunneling Excitation of Coupled Electromagnetic Modes” Univ. of Liverpool, UK, Nov. 27, 1991.

## 1990

46. “Photon Emission Studies with the Scanning Tunneling Microscope” Faculty of Sciences of Luminy, Dept. of Physics, Univ. d’Aix–Marseille II, France, Oct. 10, 1991. 1990
45. “Fundamental Aspects of Scanning Tunneling Microscopy in Polar Solvents” Int’l Conf. on Condensed Matter Physics Aspects of Electrochemistry, Trieste, Italy, Aug. 27 – Sept. 9, 1990.
44. “Electron Transfer and Photon Emission in Scanning Tunneling Microscopy” Working Party on Electrochemistry, Condensed Matter, Atomic and Molecular Aspects, Int’l Center for Theoretical Physics, Trieste, Italy, Aug. 27 - Sept. 7, 1990.
43. “Scanning Tunneling Microscopy” Prompt Programme Workshop, ESPRIT, Basic Research Action 3109, AEA Technology, Harwell Laboratory, Oxfordshire, UK, June 28, 1990.
42. “Observation of Mass Transport on Au(110)–(1×2) Reconstructed Using Scanning Tunneling Microscopy” 14th Int’l Seminar on Surface Physics, Przesieka, Poland, May 21-26, 1990.

41. "Scanning Tunneling Microscopy Applied to Surface Structures" NATO ARW, Int'l School of Crystallography 17th Course on Electron, Crystallography, Erice, Italy, April 22-28, 1990.
40. "Interpretational Aspects of Scanning Tunneling Microscopy" Fritz Haber Inst., Max Planck Soc., Berlin, Germany, Feb. 23, 1990.
39. "Electron Transfer and Photon Emission in the Scanning Tunneling Microscope" Chemistry Dept., Humbolt Univ., Berlin, Germany, May 17, 1990.

## **1989**

38. "Local Experiments with the Scanning Tunneling Microscope (STM): Past, Present and Future" European Conf. on Advanced Materials and Processes "EUROMAT '89," Aachen, Germany, Nov. 22- 24, 1989.
37. "Chemical Applications of Scanning Tunneling Microscopy" Int'l Symp. on Surface Analysis Techniques & Applications, Manchester, UK, Sept. 11-13, 1989.
36. "Scanning Tunneling Optical Microscopy (STOM) of Silver Nanonstructures" NATO ASI on Basic Concepts and Applications of STM and Related Techniques, Erice, Italy, April 17-29, 1989.
35. "Photoemission during Scanning Tunneling Microscopy" Int'l Congress on Optical Science and Engineering "Europtica: Optical Storage and Scanning Technology," Paris, France, April 24-28, 1989.
34. "Spatial Mapping and Optical Spectroscopy of Photons Emitted from the Scanning Tunneling Microscope" Amer. Phys. Soc. March Meeting, 1989, St. Louis, MO, March 20-24, 1989.
33. "Photons Emitted in the Scanning Tunneling Microscope" 9th Int'l Conf. of the Condensed Matter Division of the European Phys. Soc., Nice, France, March 6-9, 1989.
32. "Scanning Tunneling Microscopy of Molecular Clusters of Copper Phthalocyanine Adsorbed on Silver Surfaces" Int'l Conf. on Molecular Electronics – Science and Technology, Keauhou Kona, Hawaii, Feb. 19-24, 1989.

## **1988**

31. "Local Elastic and Inelastic Tunneling Processes in STM" Chemistry Dept., Oregon State Univ., Corvallis, OR, March 29, 1989. 1988
30. "Scanning Tunneling Microscopic Techniques Applied to Roughness of Silver Surfaces" Int'l Congress on Optical Science and Engineering on Surface Measurement and

Characterization, Hamburg, Germany, Sept. 19-23, 1988.

29. "Scanning Tunneling Microscopy of Plasma Exposed Surfaces" NATO ASI on Plasma-Surface Interaction and Processing of Materials, Alicante, Spain, Sept. 4-16, 1988.
28. "Field Emission Resonances" Electrostatic Potential on Solid-State Surfaces, Schloss Ringberg, Germany, March 2-5, 1988.
27. "Photon Emission Experiments with the STM" Laser Seminar, Swiss Federal Inst. of Technology (ETH) Zurich, Switzerland, Nov. 21, 1988.
26. "STM and the Inverse Photoelectric Effect" Seminar, Univ. of Düsseldorf, Germany, Aug. 3, 1988.
25. "Application of the Scanning Tunneling Microscope to Electrical Breakdown and Arcing" Fritz Haber Inst., Max Planck Soc., Berlin, Germany, July 29, 1988.
24. "Inverse Photoemission with the Scanning Tunneling Microscope" Fritz Haber Inst., Max Planck Soc., Berlin, Germany, July 28, 1988.
23. "Photon Emission Experiments with the STM" Univ. of Constance, Germany, May 26, 1988.
22. "Local Experiments with the STM" Physics Dept., Univ. of Rome, Italy, April 15, 1988.
21. "Local Experiments with the STM" Fritz Haber Inst., Max Planck Soc., Berlin, Germany, Feb. 26, 1988.
20. "Local Experiments with the STM" Lecture at Schering Berlin, Germany, Feb. 25, 1988.

## **1987**

19. "Scanning Tunneling Microscopy of the Amorphous Alloy Fe<sub>80</sub>B<sub>20</sub>" Univ. of Texas, Dept. of Mechanical Engineering, Austin, TX, Aug. 20, 1987.
18. "Transition from the Tunneling to Point Contact Regime Observed by Scanning Tunneling Microscopy" Texas A&M Univ., Dept. of Phys., College Station, TX, Aug. 18, 1987.
17. "Scanning Tunneling Microscopy of Molecular Systems" Physics Dept., Univ. of Constance, Germany, April 22, 1987.

## **1986**

16. "Scanning Tunneling Microscopy" Plenary lecture, 9th Australian Conf. on Electron Microscopy "ACEM9," Sydney, Australia, Feb. 15-20, 1986.

15. "Applications of STM to Surface Microstructure" 9th Australian Conf. on Electron Microscopy "ACEM9," Sydney, Australia, Feb. 15-20, 1986.
14. "Chemical Applications of Scanning Tunneling Microscopy" Joint Physical/Inorganic and Nuclear and Materials Science Seminar, Oregon State Univ., Corvallis, OR, Dec. 22, 1986.
13. "Scanning Tunneling Microscopy" Dept. of Physics, Peking Univ., Beijing, People's Republic of China, March 10, 1986.
12. "Construction and Use of an STM for Surface Physics" Defence Research Laboratories Salisbury, Adelaide, Australia, March 4, 1986.
11. "The History and Development of STM" Royal Melbourne Inst. of Technology, Melbourne, Australia, Feb. 28, 1986.
10. "Scanning Tunneling Microscope: A Physicist's Overview" Dept. of Physics, Univ. of Melbourne, Australia, Feb. 28, 1986.
9. "Biological and Chemical Applications of STM" Howard Florey Inst. for Medical Research, Univ. of Melbourne, Australia, Feb. 27, 1986.
8. "STM as a Local Probe for Electronic Chemical and Structural Characterization of Surfaces" Griffith Univ., Dept. of Physical Chemistry, Brisbane, Australia, Feb. 26, 1986.
7. "General Application of Scanning Tunneling Microscopy" Univ. of Queensland, Brisbane, Australia, Feb. 25, 1986.
6. "Design and Construction of an STM" School of Physical Sciences, Univ. of Sydney, Australia, Feb. 24, 1986.
5. "A Fine Sense of Touch" IBM North Sydney, Australia, Feb. 24, 1986.
4. "Physical Applications of STM" Commonwealth Scientific and Industrial Research Organization, Division of Applied Physics, Sydney, Australia, Feb. 24, 1986.
3. "Scanning Tunneling Microscopy: An Overview" Australian Optical Fibre Research Center, Canberra, Australia, Feb. 21, 1986.
2. "Scanning Tunneling Microscopy in the Physical Sciences" Australian National Univ. Research School of Physical Sciences, Canberra, Australia, Feb. 21, 1986.

## **1985**

1. "Scanning Tunneling Microscopy of Surface Microstructure on Rough Surfaces"

Workshop on Scanning Tunneling Microscopy, Lech, Austria, July 1-5, 1985.