



**2008 Applied Superconductivity Conference and Exhibition**  
**August 17 – 22, 2008**  
**Hyatt Regency Chicago – Chicago, IL USA**

**MEDIA HIGHLIGHTS**

**Conference Website: <http://www.ascinc.org>**

**PRESS REGISTRATION**

Members of the media may register by faxing a registration form (found at [www.ascinc.org](http://www.ascinc.org)) to ASC 2008 Press at (303) 499-2599, or register on-site at the Registration desk, located in the North Grand Ballroom Foyer of the Hyatt Regency Chicago. *Journalists will be asked to show press credentials/ID to receive complimentary admission to technical sessions, welcome reception and exhibitor's reception, and Exhibition Hall.* Conference program, badges and other conference materials will be available at the registration desk. Tickets for the Thursday conference luncheon may also be purchased at the desk.

**On-site Press Registration: North Grand Ballroom Foyer – Hyatt Regency Chicago**

**Hours of Operation:** Sunday, August 17: 2:00 p.m. – 8:00 p.m.  
Monday, August 18: 7:00 a.m. – 7:00 p.m.  
Tuesday, August 19: 7:00 a.m. – 6:00 p.m.  
Wednesday, August 20: 7:00 a.m. – 6:00 p.m.  
Thursday, August 21: 7:00 a.m. – 6:00 p.m.  
Friday, August 22: 7:00 a.m. – 12:00 Noon

(For media assistance and additional information, please ask for Dr. Balu Balachandran, Mr. Jim Kerby, Dr. Lance Cooley, Ms. Sue Butler, or Mrs. Paula Pair. Individual interview rooms may also be scheduled.)

**PLENARY AND OTHER SPECIAL SESSIONS**

**Monday, August 18, 8:00 a.m. - 9:00 a.m. Welcome** – Dr. Balu Balachandran, Argonne National Laboratory (Conference Chair); *Opening Remarks* – **Dr. Adam Cohen**, Deputy Associate Laboratory Director for Energy Science and Engineering, Argonne National Laboratory; *Awards* – **2008 IEEE Council on Superconductivity Awards**: 1). Max Swerdlow Award: Sir Martin Wood (Oxford Instruments), James Daley (US Department of Energy-retired); 2). Large Scale Applications Award: Akira Yamamoto (KEK Japan); 3). Materials Award: Masaki Suenaga (Brookhaven National Laboratory); 4). Electronics Applications Award: Hisao Hayakawa (University of Nagoya, Japan, retired). The IEEE CSC Van Duzer Prize and the Roger Boom Award (Cryogenics Society of America) will also be presented.

**Monday, August 18, 9:00 a.m. – 10:00 a.m. PLENARY 1AP01: “Superconducting Detectors Come of Age, -or- Ready to Leave the Lab,” Harvey Moseley** (Goddard Space Flight Center) – Cryogenically cooled superconducting (Sc) detectors have become essential tools for a wide range of measurement applications, ranging from quantum limited heterodyne detection in the millimeter range to direct searches for dark matter with Sc phonon detectors operating at 20 mK. Sc detectors have several fundamental and practical advantages, resulting in rapid adoption by experimenters. Their excellent performance arises in part from reductions in noise resulting from their low operating temperatures, but unique Sc properties provide a wide range of detection mechanisms. For example, the steep dependence of resistance with temperature on the superconductor/ normal transition provides a sensitive thermometer for calorimetric and bolometric applications. Parametric changes in the properties of Sc resonators provide a mechanism for high sensitivity detection of sub-millimeter photons. From a practical point of view, the use of Sc detectors has grown rapidly, as many of these devices couple well to SQUID amplifiers, which are easily integrated with the detectors. SQUID-based amplifiers and multiplexers have matured with the detectors; they are convenient to use, and have excellent noise performance. The 1<sup>st</sup> generation of fully integrated large-scale Sc detection systems is now being deployed. Improved understanding of detector operation, combined with rapidly improving fabrication techniques, is quickly expanding their capability. The development and application of Sc-based detectors, ultimate performance limits, and prospects for their future applications will be reviewed. Continued advances promise to enable important new measurements in physics, and with appropriate advances in cryogenic infrastructure, may result in the use of these detectors in everyday monitoring applications.

**Monday, August 18, 4:00 p.m. – 5:45 p.m. SESSION 1LX: Accelerator Magnets I: Memorial to Professor Hiromi Hirabayashi** – Colleagues will pay tribute to Professor Hirabayashi with a short remembrance, and then with presentations of current work in the field of Accelerator Magnets, which he contributed greatly to over the years. Professor Hirabayashi had a long career at KEK, including pioneering work on bubble chambers, the superconducting beam line at KEK-PS, NbTi 10T block-type dipoles, and superconductivity combined with liquid hydrogen. Most importantly, as a Professor at KEK, and a member of ICFA, chairman of the Cryogenic Society of Japan, Asian editor of Cryogenics, and board member of the ICEC, he strongly contributed to the direction of the field and the training of many in the current generation.

**Tuesday, August 19, 8:30 a.m. – 9:30 a.m. PLENARY 2AP01: “Zero-Emission Aircraft: A Potential Application for HTS Superconductors,” Cesar Luongo** (Florida State University) – The sharp increase in the cost of fuel tied with a relentless growth in air traffic will foster the development of revolutionary new aircraft technologies over the next 25 years. Zero-emission aircraft will have to be developed in response to heightened environmental concerns. There is an intense push in the industry to ultimately develop an all-electric aircraft, with fuel cells being considered as the prime generation source for aircraft propulsion. Towards that end, there is a great need to develop ultra-compact and light electric motors and actuators suitable for airborne applications. HTS superconductors are destined to fulfill the need to achieve the very high power and torque densities required in airborne electric propulsion. Prof. Luongo will present and review the challenges to develop all-electric aircraft propulsion. In particular, he will show how aircraft design philosophy needs to be re-formulated for electric propulsion, and the technology benchmarks that superconducting devices have to achieve in order to be a feasible option on an airborne platform. A review of the work of the FSU team over the last 5 years to develop system design models for all-electric aircraft will be given. In parallel, concepts have been developed for ultra-compact superconducting electric motors. Of which some are transitioning to proof-of-principle experiments. In the end it is shown that HTS superconductors can achieve the required power/torque densities for airborne applications and that once energy conversion devices (e.g., fuel cell) reach adequate power densities, all-electric aircraft can soon follow. The aircraft industry, and other transportation applications, could potentially be a major market for HTS superconductors. (\*) *Work supported by the NASA Vehicle Systems Program and the Department of Defense Research and Engineering (DDR&E) division under the URETI on Aeropropulsion and Power.*

**Tuesday, August 19, 11:30 a.m. – 12:30 p.m. Memorial Session: “Simon Foner Remembered”** – Colleagues will pay tribute to Dr. Simon “Si” Foner, experimental physicist in magnetism and superconductivity and a pioneer inventor of the vibrating sample magnetometer. Dr. Foner had an illustrious career at MIT Lincoln Labs (1953-61), and held key positions (including Chief Scientist and Associate Lab Director) at Francis Bitter National Magnet Laboratory (1961-82). After 1982, he was Senior Research Scientist affiliated with the MIT Physics Department. He was a noted author and editor, and was a Fellow and office-holder in AAAS, IEEE, and APS. Dr. Foner published over 400 refereed papers, edited four books on topics of superconductivity and magnetism and their applications, and hosted four NATO Advanced Study Institute in Europe (1970-80). In the 80’s he actively engaged in the development of high-quality superconducting wire for high field applications.

**Wednesday, August 20, 8:30 a.m. – 9:30 a.m. PLENARY 3AP01: “7 Tesla and Beyond – A Review of Superconducting Cyclotrons and Synchrocyclotrons: Present Status, Key Applications, and Future Prospects,” Timothy A. Antaya** (MIT) – Cyclotrons are in their 8<sup>th</sup> decade of use, and superconducting (Sc) cyclotrons are in their 3<sup>rd</sup> decade. Resistive magnet based cyclotrons operate around 1-3 Tesla, and the Sc cyclotrons operate at field levels of about 3-5T. Circular resonant particle accelerators in general have an inverse scaling of radius with increasing field for a given energy, translating into nearly an inverse volume scaling with increasing field in the nearly spherical Sc cyclotrons. This compactness can be exploited to make very powerful but small cyclotrons, as was done for heavy ion nuclear science, or exploit the low overall power levels (magnet, rf, cryogenics) of compact cyclotrons to make a very efficient particle accelerator, e.g., ACCEL’s PBRT cyclotrons. Recent advances in all aspects of Sc cyclotrons (beam dynamics, engineering and supporting technologies) have made the step up to even higher field levels of 7-10 T possible, resulting in remarkable compactness and efficiency, that will, as a consequence, have significant impact in all applications in which cyclotrons are employed. High field cyclotrons and their key technology issues will be discussed, followed by emerging applications in radiotherapy, PET, radiation sources and strategic nuclear materials detection. In addition, high field weak focusing cyclotrons can now be built that are better characterized as portable devices rather than as accelerator systems, setting new transportability standards. Several highly mobile systems based on such devices, the applications they enable, and their development status, which is moving forward rapidly, will be discussed.

**Wednesday, August 20, 10:00 a.m. – 12:00 p.m. SESSION 3EB: Marc Feldman Quantum Computing Memorial Session** – Colleagues will pay tribute to Marc Feldman, a creative scientist who bridged the gap between theory and experiment, particularly in superconducting electronics, by presenting a series of talks related to Quantum Computing (superconducting resonators, low-loss vacuum-gap capacitors for superconducting qubits and high-Q LC Resonators, etc.). At UC Berkeley, Chalmers University, NASA/Goddard Institute for Space Studies, the University of Virginia, and the University of Rochester, Prof. Feldman made fundamental and influential contributions in many areas, including Josephson parametric amplifiers, RSFQ logic, and quantum computing. His work constituted the basic underpinnings of Josephson array voltage standards and SIS heterodyne mixers. Recently he turned his attention to room temperature “ballistic electronics,” leading a team that envisioned room temperature transistors employing electrostatic control of electrons in a 2D electron gas. His group demonstrated transistor action in such devices just before his death.

**Wednesday, August 20, 4:00 p.m. – 5:15 p.m. SESSION 3LX: MRI and Medical Applications I – Memorial to Emanuel S. Bobrov** - Colleagues will pay tribute to Dr. Emanuel Bobrov with a brief remembrance, and then with presentations of current work in the field of MRI and medical applications. Dr. Bobrov made outstanding contributions to variety of MIT projects including very high-resolution NMR and MRI magnets, MHD, plasma fusion, high-energy physics, SMES, magnetic levitation and magnetic propulsion and other projects. He served as research engineer and project leader at Francis Bitter Magnet Lab (MIT, 1976-96), as visiting scientist at FBNML, KFZ, and GSI (1996-2002), and as a technical advisor to DOE, DOT and NSF. For almost 20 years, he was a member of the Editorial and Advisory Boards of the *International Journal of Applied Electromagnetics and Mechanics*. Dr. Bobrov co-authored over 100 papers. His name is engraved at the memorial plate at the Brigham and Women's Hospital (Boston, MA) that is dedicated to developers of the first MRI systems.

**Wednesday, August 20, 7:00 p.m. – 10:00 p.m. SESSION 3X: Late Breaking Session: "Superconductivity in Pnictides"** (sponsored by Texas Center for Superconductivity at the University of Houston) – A new class of superconductors based on layered compounds of iron and arsenic has recently been discovered. Some members of this family have critical temperatures as high as 56 K, not quite as high as for copper-oxide superconductors and just below liquid nitrogen's boiling point, but still far above that of magnesium diboride (40 K) and even farther above the workhorse materials of applied superconductivity, niobium-titanium alloy (9 K) and compounds of niobium with the A15 crystal structure (up to 23 K). Theoretical analyses have not yet determined the mechanism of superconductivity or set limits on the critical temperature, so it is quite possible that still higher critical temperatures can be reached. Tantalizing results signal tremendously high magnetic field limits and other properties favorable for applications. This session will open with brief overviews from leading groups, including Prof. Hideo Hosono (Tokyo Institute of Technology, Japan), Prof. Paul Chu (University of Houston, USA), Prof. Zlatko Tesanovic (Johns Hopkins University, USA), and Prof. David Larbalestier (Florida State University, USA). Contributed talks will follow, similar to the "Woodstock of Physics" format reminiscent of the 1987 American Physical Society March Meeting at the time of the discovery of high-temperature superconductivity.

**Thursday, August 21, 8:30 a.m. – 9:30 a.m. PLENARY 4AP01: "New Superconductors in Applications: Some Practical Aspects," James W. Bray** (GE Global Research) – The first blush of success in the search for a new superconductor is usually a high transition temperature,  $T_c$ . However, all power applications of superconductors and most other applications requires good current carrying capacity, usually characterized by  $I_c$ , within substantial magnetic fields, usually characterized by  $H_c$ . Furthermore, a number of other characteristics must be satisfied before commercial success can be obtained, such as acceptable cost, mechanical strength, stabilizers, and appropriate insulation materials. Dr. Bray will examine a number of superconductors, starting with the workhorse NbTi, and look at the long road to success for the successful commercialization of a new superconductor.

**Thursday, August 21, 12:00N – 1:00 p.m. ASC 2008 Conference Luncheon** (Ticket required. Purchase by Tues., 8/19)

**Friday, August 22, 8:30 a.m. – 9:30 a.m. PLENARY 5AP01: "Recent Events in Applied Superconductivity in China," Songtao Wu** (ITER Organization/ASIPP) – With strong support from Chinese government bodies such as the National High Technology Research and Development Program of China (863 programs) and the National Basic Research Program of China (973 programs), the field of applied superconductivity in China has been developed in different areas. Especially in the fusion application area, the first fully superconducting tokamak, EAST (Experimental Advanced Superconducting Tokamak), has been successfully constructed and commissioned in the last two years. Based on the requirement from the ITER project, high performance Bi-2223 HT<sub>c</sub> tape, and Nb<sub>3</sub>Sn and NbTi strands have also been developed. In the area of HT<sub>c</sub> applications for electric power systems, R&D has been focused on Superconducting Magnetic Energy Storage (SMES), Superconducting Fault Current Limiters (SFCL) and MRI. A 1MJ/500kVA SMES and a saturated iron-core type 35kV/90MVA FCL have been built and their integration into transmission networks demonstrated. A 45 T hybrid high magnet facility has been recently approved by the Chinese government. Finally a 100 km/h HTS Maglev test line has been proposed. Recent progress in applied superconductivity in China will be reported.

**Friday, August 22, 10:00 a.m. – 12:00 p.m. SESSION 5EA: Roger Koch Memorial Session** – Colleagues will pay tribute to Roger Koch with a short recollection of his scientific career, followed by presentations of current research in fields in which he worked including superconductivity, the Josephson effect and Superconducting QUantum Interference Devices (SQUIDS). Roger was a graduate student at the University of California, Berkeley, and spent the rest of his career at the IBM T. J. Watson Research Center in Yorktown Heights, NY. In addition to ongoing work on both low- and high-transition temperature superconductivity and SQUIDS, his research interests included electrical noise, spin-glasses, percolation, electromigration, dynamics of nanomagnetic systems, flux-gate magnetometers, geophysics, scanning tunneling microscopy, neural networks, chaos and quantum computing. He was a Fellow of the American Physical Society.

**Friday, August 22, 12:30 p.m. – 2:30 p.m. SESSION 5LX: Accelerator Magnets V: Paul Reardon Memorial Session** – Colleagues will pay tribute to Paul J. Reardon with a short remembrance, and then with presentations of current US work in the field of superconducting magnets used for particle accelerators. As the first head of what was to become the Tevatron at the Fermi National Accelerator Laboratory he played a key role in the industrialization of superconducting magnets from the purchase of raw materials to the final testing and assembly. Reardon enjoyed a long and successful career as a key manager of

DOE large projects. He was the initial leader of the booster injector at Fermilab, manager of TFTR at Princeton, and SSC. He served as co-chair of the 1974 Applied Superconductivity Conference.

**EXHIBITION** – Riverside Center, Hyatt Regency Chicago, Monday – Tuesday, 9:00 a.m. – 5:00 p.m., Wednesday, 12:00 p.m. – 5:00 p.m. and Thursday, 9:00 a.m. – 12:00 p.m.

Join over 50 leading product manufacturers and service providers in the field of superconductivity and related areas. Visit with company representatives as they exhibit the latest products, services and techniques. For additional exhibit information, visit: [http://www.ascinc.org/r/index.php/t/exhibit\\_information](http://www.ascinc.org/r/index.php/t/exhibit_information).

### **ADDITIONAL SOCIAL EVENTS**

**Sunday, August 17, 6:00 p.m. – 8:00 p.m., Welcome to Chicago Reception**  
Crystal Ballroom, Hyatt Regency Chicago (*ticket required*)

**Monday, August 18, 6:00 p.m. – 7:00 p.m., Exhibitors Cocktail Reception**  
Riverside Center, Hyatt Regency Chicago