

Annual report of the Technical Committee on Physical Acoustics

(See September and October issues for additional reports)

It has been an honor for me to be your Chair and a pleasure to have the opportunity to work with a very talented, highly motivated, and friendly group of Physical Acoustics (PA) committee members (along with Acoustical Society of America (ASA) members across the board) in the long-range planning of ASA activities and special sessions for future meetings.

It has been a very productive and exciting year for the Physical Acoustics Technical Committee of the ASA as is evident from the success at both the Fourth Joint Meeting of the ASA with the Acoustical Society of Japan (ASJ) (held in Honolulu from 28 Nov.–2 Dec. 2006) and the 153rd Salt Lake City Meeting (4–8 June 2007).

The planning of the special sessions for the Joint ASA/ASJ Hawaii Meeting began during the tenure of our past Chair, Tom Matula (2003–2005). Tom received outstanding PA support with the following special sessions topics, and ASA organizer and co-chair (both in parenthesis): (a) Infrasound (Hank Bass, Milton Garces); (b) Sonic boom from supersonic aircraft and projectiles (Victor Sparrow); (c) Sound speeds, phonons, and the thermodynamics of condensed matter (Albert Migliori, Christian Pantea); (d) Cavitation (Claus-Dieter Ohl); (e) Sound propagation in inhomogeneous media - joint with Biomedical/Ultrasound/Bioresponse to Vibration (BB) (James G. Miller); (f) Celebration of Floyd Dunn—BB session joint with PA (Larry Crum, William D. O'Brien); and (g) Prediction and propagation of outdoor noise—Noise (NS) session joint with PA (D. Keith Wilson).

During the 151st Providence meeting, your current Chair met with Dr. Yo-iti Suzuki (Current President of ASJ and Chair of Technical Program Committee) and Dr. Hiroshi Sato (Current Secretary of ASJ Technical Program Committee) to develop a well thought out program involving all the technical committees. Subsequently, ASJ and ASA organizers collaborated to put together their special sessions. Here we mention that Dr. Jun-ichi Kushibiki (Tohoku University) was our ASJ PA representative.

Hank Bass volunteered to be the PA Technical Program Organizing Committee (TPOM) representative. Contributed papers were organized into two other sessions; (h) Thermoacoustics (co-chair Steven Garrett); and (i) Landmines and Ultrasonics (co-chair Roger Waxier). Thanks, Hank, for all your help.

The following sessions: (b) “Sonic boom,” (d) “Cavitation,” (e) “Inhomogeneous media,” and (f) “Floyd Dunn,” were held in two parts.

Physical acoustic leadership is present in the Society. Our President, Anthony Atchley (2005–2006), also served as ASA Technical Program Chair. Let's also mention that Giles Daigle (another former PATC Chair) is our ASA President Elect (2006–).

Larry Crum was invited to give a plenary lecture entitled “Therapeutic Ultrasound,” at the opening ceremonies. Thanks, Larry, for an outstanding talk!

One of the highlights of the meeting was Hank Bass receiving the Silver Medal in Physical Acoustics. The citation reads “for leadership in physical acoustics and contributions to the understanding of atmospheric sound propagation.” Congratulations Hank!

PA special sessions (a) “Infrasound” included continuous monitoring experiments, the eruption of the Tungurahua volcano, tornadoes and storms, high-altitude experiments, 3D modeling, the observation system in Isumi, Japan, and wind noise contributions; (b) “Sonic booms” covered propagation through turbulence, research in the Japanese Aerospace Exploration Agency, results from an entry vehicle, the supersonic biplane, ballistic range simulation, turbulence and atmospheric effects, discrete modeling, simulation, perception, human and structural response, effects of a Minuteman II missile, and spherically diverging N waves; (c) “Phonon/condensed matter” covered measuring elastic properties by inelastic neutron scattering, monocrystals and Blackman diagrams, propagation in ferromagnetics, thin films and ultrasonic spectroscopy, hydrogen absorbing crystals, elastic tensor of Osmium, capillary wave excitation, light and Brillouin scattering, hyper-sonic phononic and sonic crystals, and photoelastic Lamb wave visualization; (d) “Cavitation” included bubble fusion in deuterated acetone, ultrasonic frequency dependence in sonochemical reactions, comparing sonoluminescence and water vapor plasma spectra, nucleation and growth in cavitation bubbles, sonoluminescence in sulfuric acid, oscillation and bubble collapse, bubble shock interaction, plasma generation by E&M radiation, controlled cavitation, bubble and elastic particle interactions, and multi-bubble cavitation; (e) “Inhomogeneous media I” involved acoustic wave

studies to characterize various elastic and porous material properties in cancellous, cortical, and trabecular bone using ultrasonic measurements, acoustic microscopy, and slow and fast wave studies; “Inhomogeneous media II” studied porous, granular, bubbly medium, sediments, nonlinear surface waves in soil, hysteretic nonlinearity of soil, and nonlinear acoustic landmine detection.

PA contributed sessions (h) “Thermoacoustics” topics included the amplification of acoustic intensity of pulse waves, spatial instabilities leading to spatial patterns, anharmonic resonators, loop-tube cooling systems, marginal instabilities, energy conversion studies, laser Doppler anemometry measurements of acoustic intensity in an arbitrary terminated pipe, and band structure in a multiside branched system; (i) “Landmines and Ultrasonics” covered an optimized seismo-acoustic array, nonlinear cw and time-reversal landmine detection techniques, acousto-optic interactions from a surface wave perturbed by underwater sound, improvement of dispersion of nanometer diamond particulates by ultrasound, ultrasonic scattering by polycrystalline material, multiple sources for focusing ultrasonic waves, standing wave particle transport, and transfer function analysis for coherent and reverberant fields.

PA had planned four special sessions in Salt Lake City. Andi Petculescu organized: (a) Acoustic probes of planetary environments, James Sabatier (who recently became the Chair of Education in Acoustics (ED)) planned (b) Physical acoustic demonstrations (joint with ED), Albert Migliori and Veerle M. Keppens co-organized (c) Ultrasound in condensed matter, neutrons, nanomaterials, magnetisms, and Steve Garrett took the Society to uncharted waters with his (d) Acoustical genealogy poster session (joint with ED and open to all).

Kent Gee and Richard Raspet (who is now our PA representative for standards) volunteered to be the PA TPOM representative. Contributed papers were organized into three other sessions; (e) Atmospheric acoustics (chair, Michael White); (f) Nonlinear and linear seismology and time reversal in solids (chair, Brian Anderson); and (g) Bubbles modes and scattering (chair, A Mark Wochner). Thanks, Kent and Richard, for all your help.

Congratulations to Edwin Carstensen, who received the 2007 Helmholtz–Rayleigh Interdisciplinary Silver Medal in Biomedical Ultrasound/Bioresponse to Vibration and Physical Acoustics ... “for contributions to the physics of biomedical ultrasound.” Ed's work is inspiring.

PA special sessions (a) “Acoustic probes” topics included planetary exploration using acoustical instrumentation, microphone design for use on Mars' surface, propagation in planetary atmospheres (Venus, Earth, Mars, and Titan), and the Huygens probe on Titan and alien soundscapes; (b) “PA demonstrations” involved live demos showing Faraday waves (Holt), parametric array (Wilson), hysteresis in a soil-elastic plate oscillator (Korman Letcher), 2D resonant visualization using a birefringent solid (Gladden), ultrasonic signatures of human motion (Ekimov and Sabatier), angular dependence of target strength (Tucholski), a demo of human hearing using a cochlea analogue (Tomlinson), and a demo of a physical model of the active cochlea (Jovic); (c) “Ultrasound in condensed matter” topics included tribological properties of metal dichalcogenide nanostructures, monocrystal elastic constants, low-temperature magnetoacoustic measurements to study superconductive transitions in Sr_2RuO_2 , neutron, x-ray, and nuclear resonance scattering applied to lattice dynamics in thermoelectric materials, charge ordering transition as probed by ultrasound, elasticity in metallic glasses, pulse-echo ultrasound in pulsed magnetic fields, thermal diffusivity in a superconductor using open-cell photoacoustic technique, third-order elastic constants of langasite single crystals, and diffuse waves in solids and spectral density predictions; (d) “Academic genealogy” covered the family trees of Rudnick–Putterman (Garrett), Brian E. Anderson (BEA), Harvard acoustics back to Helmholtz (Blackstock), Katherine Safford Harris (Bell-Berti), F. V. Hunt and Harvard (Wright), Jiri Tichy (Sommerfeldt and Leishman), R. T. Beyer (Korman and Letcher), Indiana University history (Yost), P. Marston (Matula), R. Bruce Lindsay (P. H Rogers), Apfel and Yale (Ketterling), National Research Council of Canada (Daigle and Stinson), and National Center for Physics and Acoustics (Bass and Sabatier).

PA contributed sessions (e) Atmospheric acoustics (chair, Michael White) covered surface waves in the nocturnal boundary layer, propagation at a forest edge, localization using an array of aerostats, refraction effects from wind and turbulent stability scale, noise reduction by windscreens, reverberation in an urban environment, time domain boundary conditions, impulse propagation in a boundary layer, maximum likelihood estimates, infrasound, and coherence through turbulence; (f) Nonlinear and linear seismology and time reversal in solids (chair, Brian Anderson) topics included nonlinear oscillations of a buried object, nonlinear cw and time reversal methods in landmine detection, seismic pulses from an explosive source,

acoustic/seismic transfer function, long term linear and nonlinear acoustic field tests of soils and source imaging using time-reversal experiments; (g) Bubbles, modes, and scattering (chair, Mark Wochner) covered sonoluminescence from transient cavitation, coupled radial and translational motion of a bubble, bubble shape oscillations, liquid capillary jet waveguide, Scholte–Stonely wave generation, nonlinear shear waves, leaky Rayleigh waves, thin plate and shell experiments involving zero-group velocity Lamb modes, mode shape predictions, Wigner space-time spectral energy density of a beam pattern at a liquid-solid interface, and multiple scattering of cylinders in a porous media; (h) Thermoacoustics (chair, Richard Raspet) topics included a high-frequency cooler, annular high-frequency prime mover, particle image velocimetry inside a stack-heat exchanger couple, synchronization of small thermoacoustic oscillators, acoustic conversion of heat to sound, computational methods, pressurized high-frequency acoustic heat engine, and miniature prime mover operating at 10 kHz.

All said, the Hawaii and Salt Lake City Meetings were a big success for PA.

For the past year Anthony Atchley has been our President. He has done an outstanding job for the ASA, and much success has come out of his hard work. He has also shown tremendous leadership, enthusiasm, and guidance in matters relating to the PATC. I am grateful and very fortunate to have had Anthony's guidance during my term as Chair. Although Anthony's term as President ended after Salt Lake City, he continues to serve as a member of the Executive Council joining Wayne Wright who also serves on the Executive Council.

Gilles Daigle has been elected our new President and Mark Hamilton has been elected our new President Elect. Congratulations and good luck to our new officers, Gilles and Mark! Victor Sparrow (who served on the Executive Council with Wayne) becomes our new Vice-President Elect and gains a seat on the Technical Council. Congratulations and good luck to Vic! PA representation, along with our Editor-in-Chief, Allan Pierce, appears to be very strong.

It is time to acknowledge members of PA who volunteer their services on various committees:

Tom Matula currently serves on the Medals and Awards Committee. Tom officially took over in Honolulu. Robert Keolian and James Sabatier, both predecessors of this position, have worked hard to do a great job for the Society and remain active in helping on this Committee. Steve Garrett serves on the Membership Committee; Phil Marston serves on the Books Committee, and Richard Raspet serves on the ASA Committee on Standards, replacing Sameer Madanshetty, who has done an excellent job. Todd Haye is our outstanding Student Council representative.

Other items: David Blackstock is extremely active in the Student Council and the program involving "Take a Student to Lunch." Keith Wilson is our editor of JASA-EL. Ron Roy who received the Eastman Fellowship returns from his 1 year sabbatical in Oxford.

Congratulations to Ken Gilbert, Andrea Prosperetti, Alexandra Tolstoy, Yves Berthelot, and Ron Roy, for 25 years of service to ASA. Supercongratulations to Gideon Maidanik and Richard Stern for 50 years of service.

Special thanks to Albert Migliori for bringing to the Society the innovative research that involves new approaches connecting ultrasonics and condensed matter physics.

The 2006 Physical Acoustics Summer School, PASS 2006, took place from 18–25 June 2006, at Sunrise Springs, La Cienega, New Mexico. The program is jointly run by NCPA (Hank Bass) and Perm State (Anthony Atchley), with strong ASA ties. The next meeting will take place in 2008.

I would like to take this time out to thank Larry Crum for his ongoing service, leadership, and quality of his research that he brings to both PA and BB. He is a role model and his enthusiasm is contagious.

The 154th Meeting of the ASA will take place in New Orleans 27 Nov.–1 Dec. 2007. There are two special sessions (see the most recent call for papers).

The 155th Meeting is a joint meeting called Acoustics'08 Paris which will be held in Paris 29 June–4 July 2008. The ASA, the European Acoustics Association (EAA), and Société Française d'Acoustique (SFA) are organizing a joint meeting integrating ecua: the 9th European Conference on Underwater Acoustics & euonoise: the 7th EUROpean Conference on NOISE Control, along with a celebration of the 60th anniversary of the SFA.

Your Chair has met with Manell Zakharia (SFA), (the Chair of Acoustics '08 in Paris), Technical Program Organizing Committee Co-chair Philippe Blanc-Benon (SFA), and communicated with my Physical Acoustics European special session co-organizer Walter Lauriks (EAA), along with

other ASA organizers to help coordinate the 15 structured sessions that ASA members in Physical Acoustics have organized with their fellow European co-chairs.

Thank you, PATC members, for all your help.

MURRAY S. KORMAN

Chair

Meetings Calendar

Listed below is a summary of meetings related to acoustics to be held in the U.S. in the near future. The month/year notation refers to the issue in which a complete meeting announcement appeared.

2008

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| 21–23 Feb | 2008 National Hearing Conservation Assn. Conference, Portland OR [NHCA, Tel: 303-224-9022; Fax: 303-770-1614; Web: www.hearingconservation.org]. |
| 29 June–4 July | Acoustics08, Joint Meeting of the Acoustical Society of America (ASA), European Acoustics Association (EAA), and the Acoustical Society of France (SFA), Paris, France (Acoustical Society of America, Suite 1N01, 2 Huntington Quadrangle, Melville, NY 11747-4502; Tel: 516-576-2360; Fax: 516-576-2377; E-mail: asa@aip.org ; Web: http://asa.aip.org/meetings.html). |
| 2–6 July | International Clarinet Association Clarinetfest®2008, Univ. of Missouri—Kansas City, MO (Dr. John Cipolla, Department of Music, Western Kentucky University 1906 College Heights Blvd. #41029, Bowling Green, KY 42101-1029, Tel.: 270-745-7093; E-mail: john.cipolla@wku.edu). |
| 27–30 July | NOISE-CON 2008, Dearborn, MI (Institute of Noise Control Engineering, INCE Business Office, 210 Marston Hall, Ames, IA 50011-2153, Tel.: 515-294-6142; Fax: 515-294-3528; E-mail: ibo@inceusa.org). |
| 21–25 July | 9th International Congress on Noise as a Public Health Problem Quintennial meeting of ICBEN, the International Commission on Biological Effects of Noise). Foxwoods Resort, Mashantucket, CT (Jerry V. Tobias, ICBEN 9, Post Office Box 1609, Groton CT 06340-1609, Tel. 860-572-0680; Web: www.icben.org . Email icben2008@seglobal). |

Cumulative Indexes to the Journal of the Acoustical Society of America

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Some indexes are out of print as noted below.

Volumes 1–10, 1929–1938: JASA, and Contemporary Literature, 1937–1939. Classified by subject and indexed by author. Pp. 131. Price: ASA members \$5; Nonmembers \$10.

Volumes 11–20, 1939–1948: JASA, Contemporary Literature and Patents. Classified by subject and indexed by author and inventor. Pp. 395. Out of Print.

Volumes 21–30, 1949–1958: JASA, Contemporary Literature and Patents. Classified by subject and indexed by author and inventor. Pp. 952. Price: ASA members \$20; Nonmembers \$75.

Volumes 31–35, 1959–1963: JASA, Contemporary Literature and Patents. Classified by subject and indexed by author and inventor. Pp. 1140. Price: ASA members \$20; Nonmembers \$90.

Volumes 36–44, 1964–1968: JASA and Patents. Classified by subject and indexed by author and inventor. Pp. 485. Out of Print.

Volumes 36–44, 1964–1968: Contemporary Literature. Classified by subject and indexed by author. Pp. 1060. Out of Print.