What’s new with the CAV?

Center for Acoustics and Vibrations

The Pennsylvania State University

May 14-15, 2012
CAV researchers identify and solve problems that matter

The CAV has three core missions:

— To strengthen basic and applied research in related engineering areas
— To provide a base for technology transfer to industry
— To foster graduate education in acoustics and vibration engineering

- Acoustics, Aerospace, Mechanical, Civil, Architectural, Electrical, Meteorology, Physics, Biology
The CAV is organized around communication & technical focus

**Focal point for acoustics & vibration technology**
- *Multi-departmental*
- Interest groups
- Lunch seminars
- Visiting scholars
- Foster joint activities

**Industry member interactions**
- Spring Workshop
- Share tech challenges
- Short course / conference – ACS distance ed discount
- Informal consultation
- Seminars video-streamed
- Newsletter
- Meet students

*Center for Acoustics and Vibration*
The CAV is a network of talented and dedicated people

Director – George Lesieutre
Associate Director – Steve Hambric

Technical Groups and Leaders
Acoustics Characterization of Materials - Bernhard Tittmann
Active Structures & Noise Control - George Lesieutre
Flow-Induced Noise – Dean Capone
Machinery Prognostics & Condition Monitoring – Karl Reichard
Propagation & Radiation - Victor Sparrow
Rotorcraft Acoustics & Dynamics - Edward Smith
Structural Vibrations & Acoustics – Steve Hambric
Underwater Acoustics and Instrumentation – Chris Barber
International Liaisons monitor the pulse of global technology

Jeremy Astley (Philip Joseph)
Institute of Sound and Vibration Research
U.K.

Lars Enghardt
DLR-Institut fuer Antriebstechnik
Germany

Antonio Concilio*
Centro Italiano Ricerche Aerospaziali
Italy

Jean-Louis Guyader (Goran Pavic)
INSA de Lyon, Vibrations and Acoustics Laboratory
France

Yang-Hann Kim
KAIST, Vibrations and Acoustics Laboratory
Korea
Government Liaisons keep us apprised of opps and advances

Keith Gillis, Lee Gorny  
_NIST_

Jerry Rouse  
_Sandia National Laboratories_

Thomas Scarbrough  
_US Nuclear Regulatory Agency_

Kenneth Yamamoto, Santosh Parakkal  
_US Army ERDC-CRREL_

(Others from these and other organizations not in attendance today.)
Corporate Sponsors focus us on problems that matter

Bettis Atomic Power Lab - Eric Salesky, George Libby, Matthew Sprague
Boeing – Joseph Wat, Adam Weston, Kawthar Kasim
Electric Boat - Michael Thiel
Fisher Controls Technology Int’l - Al Fagerlund, Shawn Anderson
GE Global Research - Andrew Gorton, Yogesh Potdar, Michael Wittbrodt
Gulfstream – Kristopher Lynch, Tyler Relf
KCF Technologies* – Jacob Loverich, Jeremy Frank, Gary Koopmann
Knolls Atomic Power Lab (BMPC) - Steve Dunn, William Daisak, Timothy Vanvliet, Patricia Vieta
Lord Corporation - Mark Downing, Harris Halilovic
Martin Guitars –Albert Germick, Brenden Hackett
Moog – Eric Anderson, Chris Layer, Stephen Smith / Rainer Growitz (CSA Eng’g)
Newport News Shipbuilding - Kevin Smith, Vincent Nguyen, Pete Piazczek
Siemens Corporate Research – Justinian Rosca
Toyota Technical Center – Yeongching Lin
United Launch Alliance - Edward Heyd, John Hacker
United Technologies Research Center - Jeff Mendoza
Volvo Construction Equipment – John Wang, Hongan Xu
Westinghouse Electric Company - Larry Corr

* small company
Corporate Guests are potential future CAV sponsors

Pratt & Whitney – Ashish Ghai
Shure – Scott Grinker
CAV Short Courses help keep our sponsors current

- Fundamentals of Sound and Vibration Measurements
  - Presented by Dr. Chris Barber
  - 1 day following the CAV Workshop
  May 16, 2012

What would be helpful to you in the future? Let us know!
CAV group seminars can be enjoyed from your desk.

Research in the Electroactive Materials Characterization Laboratory

Zoubeida Ounaies and Group
Penn State is a research powerhouse

- In FY 2011, Penn State researchers performed $805M of research
  - ARL $142M; Engineering $114M
  - Projects with more than 400 companies
    - http://www.research.psu.edu/osp (new IP policy)
    - $107M with industry (4th in the U.S.)
      - http://www.research.psu.edu/about/reports/annrep11.pdf

- Unique strengths in engineering and the physical sciences
  - 350 Engineering faculty; 650 ARL researchers
  - Positioned to educate the next generation of vibrations and acoustics engineers
Example: Penn State is advancing rotorcraft research

- In 2011, Penn State was selected by the U.S. Army and NASA to lead a $12.5M Vertical Lift Research Center of Excellence
- Penn State’s VLRCOE is one of only three in the U.S.
  - In 16th year
  - Major source of talent
Penn State is educating the next generation of citizens and engineers

- **Penn State**
  - 39,000 undergraduates at UP (82,000 total)
  - 6,200 graduate students at UP (14,600 total)
    - 2500 international students
  - 4800 graduate students via World Campus
  - >600,000 living and loyal graduates

- **College of Engineering**
  - 6470 undergraduates (+2000 non-UP)
    - 2nd in B.S. degrees (~1350)
    - Highest math and overall SAT scores (sometimes verbal!)
  - 1460 graduate students (1560 w/PT; 780 int’l)
    - 33rd in M.S. degrees (~300)
    - 11th in Ph.D. degrees (~150)
Vision: Develop World-Class Engineers

- World Class Engineer
  - Aware of the world
  - Solidly grounded
  - Technically broad
  - Ethical
  - Innovative
  - Effective in teams
  - Successful as leaders
Penn State engineering grads are highly sought after.

The Wall Street Journal’s poll of corporate recruiters ranked Penn State as the #1 university from which they like to hire students — For producing the best-prepared, most well-rounded graduates who are equipped to succeed.
Your companies can have an impact at Penn State

- **Visit us** (Seminars)
- **Hire our students**
  - Co-ops, internships, undergrads, grads
  - Several CAV students have resumes today
- **Advise us** (CAV, IPACs, design teams)
  - ABET feedback
- **Sponsor student activities**
  - Undergraduate design projects; society meetings
  - Graduate research; joint proposals
- **Provide financial support**
  - Scholarships and fellowships
  - Program funds
    - Laboratory facilities and projects; Lecture series
  - Faculty Chairs & Professorships
    - Visiting positions from industry
Partnering with Penn State CAV makes good business sense

- **Interdisciplinary Research**
  - Facilitated through University-wide initiatives and fostered by a unique intellectual climate that crosses traditional academic boundaries

- **Well-Prepared Students**
  - Abundant opportunities to put learning into practice and build time-management, organizational and collaborative skills

- **Global Reach, Global Impact**
  - Extensive online World Campus; alumni in leadership positions at major global enterprises

- **Industry-Friendly Partnering**
  - Streamlined contracting procedure, complemented by a staff of experienced professionals

- **Revolutionary IP Posture**
  - Flexible approach to IP management in industry-sponsored research, leading to simplified negotiations and faster time-to-market

Rated #1 online institution; Presence in > 150 countries; Global Engagement Partners

PSU does not seek to retain ownership of IP developed from research programs funded by industry
Penn State can help you shape your future and meet objectives

- Maximize Your Research Investment
  - Leverage PSU cutting-edge research, and capitalize on outstanding faculty and students and on a novel, flexible IP policy

- Strengthen Your Brand Recognition
  - Put PSU institutional loyalty to work at boosting visibility across customers, policy makers and future employees

- Globalize Your Business
  - Gain know-how navigating geopolitical and cultural complexities to expand opportunities, improve profitability and maximize success

- Transform Your Workforce
  - Exploit PSU executive / professional education opportunities as well as partner-tailored and jointly-developed training programs

- Acquire Talent to Enhance Your Operations
  - Establish a conduit to versatile and innovative graduates with fresh ideas on driving operational effectiveness and competitive advantage

- Demonstrate Your Corporate Responsibility
  - Be pro-active in tackling social, political and environmental challenges
  - Meet and exceed customer and business-partner expectations
We listened to you, and made some changes

- Workshop
  - Two full days
    - more time for Q&A and networking
  - Panel discussions
  - More students (and poster competition)

- We circulate job postings to CAV students

- We send CAV faculty for consultation
CAV Workshop Agenda – Monday

8:15 AM  Welcome and Introductions
8:45 AM  Flow-Induced Noise
9:15 AM  International Liaison: DLR-Berlin
9:45 AM  CAV sponsor: Boeing
10:15 AM Break
10:45 AM International Liaison: ISVR
11:15 AM Panel: Flow-induced vibration & noise
12:00 PM Lunch
1:15 PM  Acoustic Characterization of Materials
1:45 PM  CAV sponsor: Moog
2:15 PM  Machinery Prognostics & Monitoring
2:45 PM  Rotorcraft Acoustics and Dynamics
3:15 PM  Break and travel
3:45-5:00 Tours (Millenium Science, Hammond)
6:00 PM  CAV Picnic and student posters
CAV Workshop Agenda – Tuesday

8:15 AM  Adaptive Structures and Noise Control  George Lesieutre
8:45 AM  International Liaison: INSA de Lyon  Goran Pavic
9:15 AM  Structural Vibration and Acoustics  Steve Hambric
9:45 AM  CAV sponsor: United Launch Alliance  Ed Heyd
10:15 AM Break (poster awards)
10:45 AM Government Liaison: Sandia Natl Labs  Jerry Rouse
11:15 AM Panel: Vibration and noise control  Mark Downing
12:00 PM Lunch  Boardroom II
1:15 PM  Underwater Acoustics  Chris Barber
1:45 PM  Propagation and Radiation  Vic Sparrow
2:15 PM  Graduate Program in Acoustics  Vic Sparrow
2:30 PM Break
3:00 PM Wrap-up and feedback  All