Celebrating 15 Years of SIAM CSE
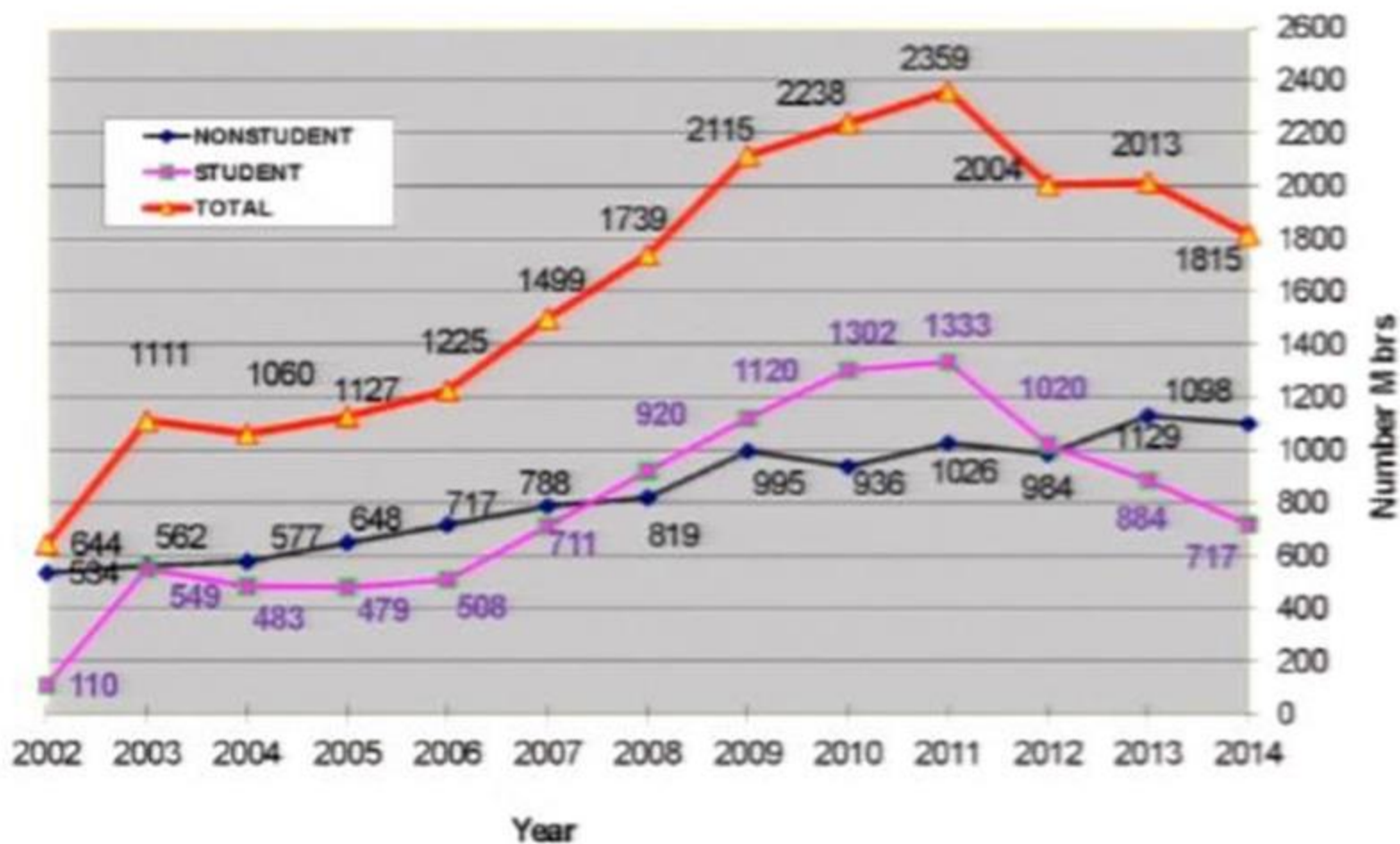
Linda Petzold
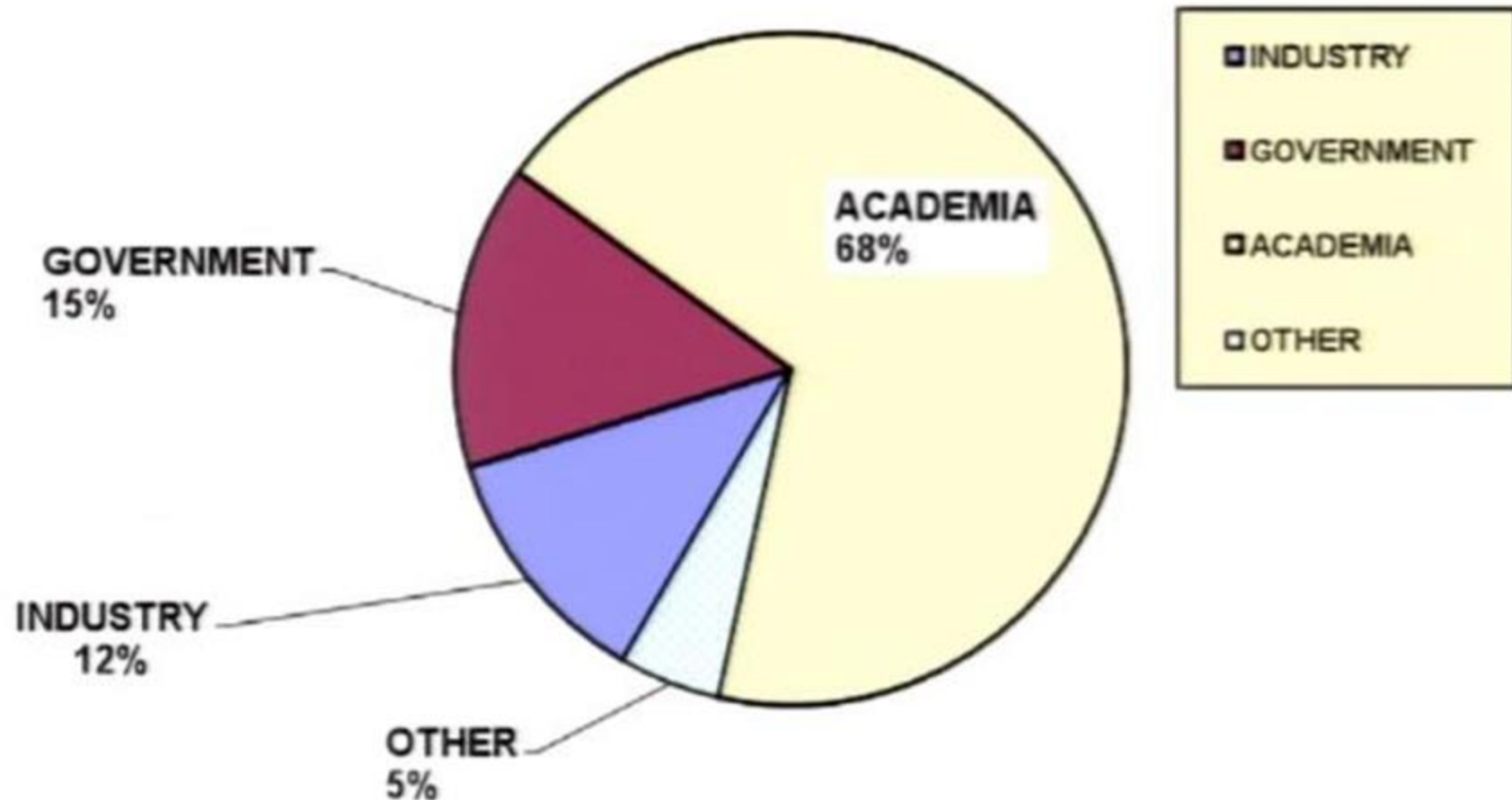
The SIAG on CSE – Some History

❖ Proposed formally at the 2000 meeting of SIAM Board of Trustees

❖ Petition came from: Ashby (Chair), Boggs, Keyes, Manteuffel, Petzold and Strang

❖ Discussion: There was some concern about overlap with the SIAG on Supercomputing. The consensus was that the CSE SIAG would be fulfilling a very important need and had a very high probability of success.
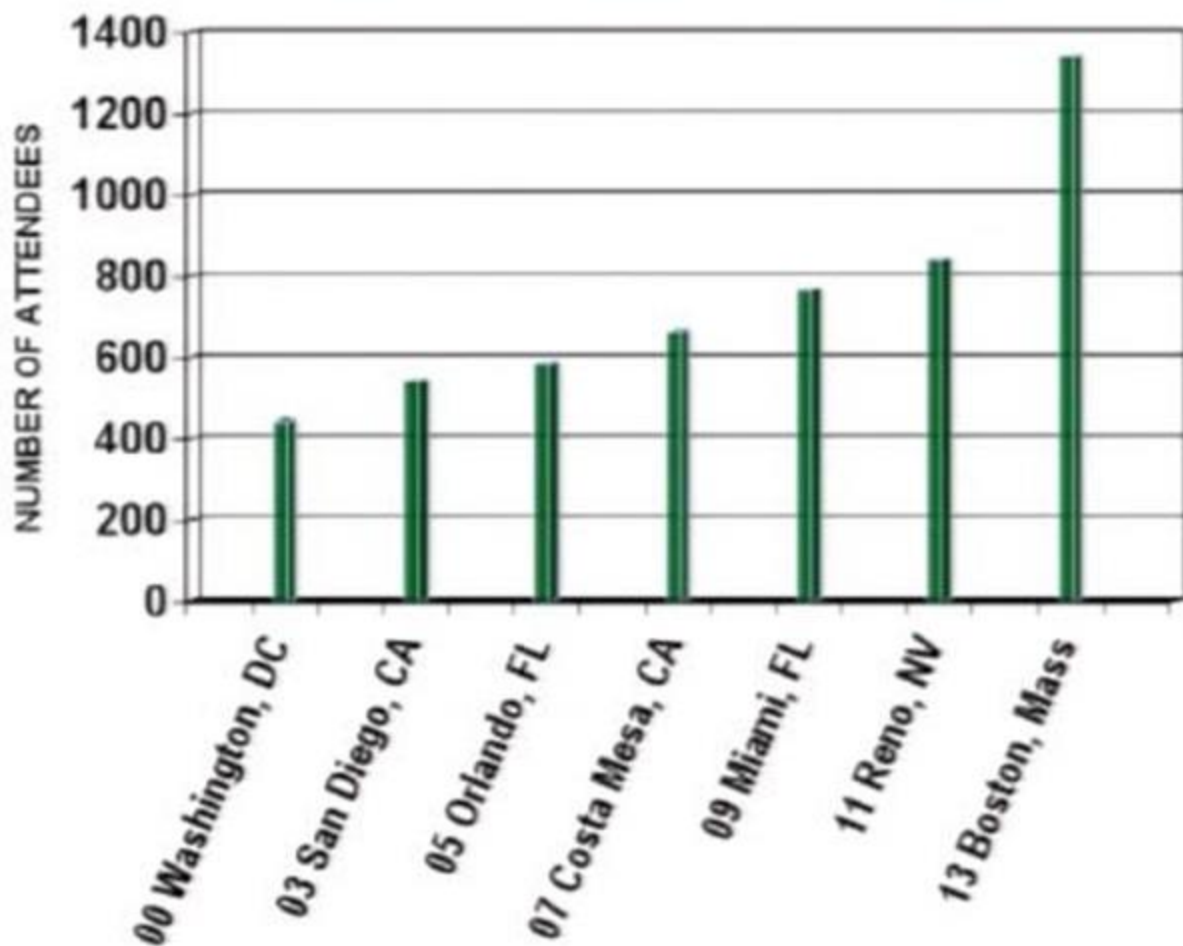
SIAG/CSE Membership History

Who are we?

GOVERNMENT
15%

ACADEMIA
68%

INDUSTRY
12%

OTHER
5%

□INDUSTRY
■GOVERNMENT
□ACADEMIA
□OTHER

The First SIAM CSE Meeting

❖Year: 2000, Location: Washington DC

❖Organizers: Ashby, Strang, Petzold

❖Attendance: 444

❖Popular topics: Chemical engineering, combustion, computational biology, computational chemistry, mechanics, optimization, problem-solving environments, weather prediction, CSE education, computational materials, computational electromagnetics

SIAG/CSE Conference History

2015 SIAM CSE Meeting

- ❖ Location: Salt Lake City, Utah
- ❖ Organizers: De Sterck, Johnson, McInnes
- ❖ Attendance: > 1500

Popular topics: 2015 SIAM CSE

- Popular topics: CSE software, big data analytics, physics-compatible numerical methods, high-accuracy numerical methods, compressed sensing, multiphysics-multiscale-multilevel modeling, reduced-order modeling, visual data analysis, multi-modal methods and data fusion, biomedical computing, computational neuroscience, V&V and UQ, extreme-scale &hardware-aware algorithms, modeling & computing complex flows, computational statistics, CSE education

SIAM Reports on CSE Education

Graduate Education in Computational Science and Engineering

SIAM Working Group on CSE Education: 2001

Undergraduate Computational Science and Engineering Education

SIAM WORKING GROUP ON CSE UNDERGRADUATE EDUCATION, 2011

Discussion of new whitepaper on Future Directions in CSE Education in Research. MS131 Monday morning, and Monday lunchtime Forward Looking Panel.

Opportunities to comment! The draft is available at: http://wiki.siam.org/siag-cse

Beyond the Third Pillar

- CSE as a predictive science:
  - Modeling, simulation, data analytics, HPC, UQ

  Tinsley Oden, Monday lunchtime Forward Looking Panel

- Interactive tools using simulation, machine learning and vizualization to enable the acceleration of scientific discovery

- Medicine: Real-time data collection of patient data at the molecular level will result in enormous challenges and opportunities for CSE

Looking Toward the Future

- CSE is a success! We have grown in numbers, and expanded our focus to problem domains and CSE technologies that were not apparent 15 years ago.

- Embrace the future!
  - Avoid the temptation to draw
    a disciplinary boundary around CSE
  - When in doubt, be inclusive