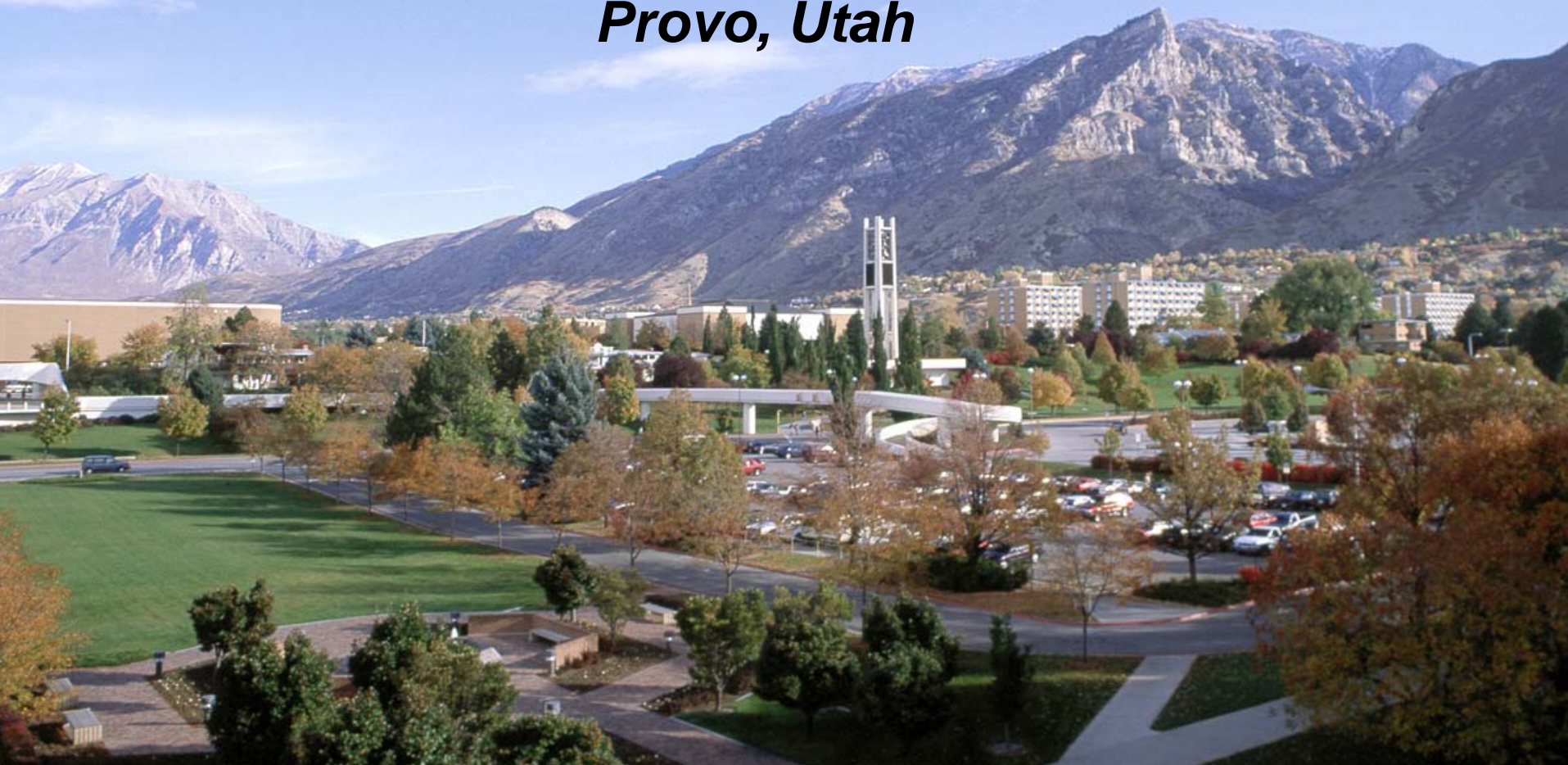


The 21st Annual ACERC Conference



*February 27-28, 2007
Provo, Utah*





ACERC History

1976 – Combustion work at BYU, Doug Smoot lab director

- Various contracts, including industrial consortiums

1986 – ACERC Founded by the NSF, directed by Doug Smoot

- BYU/UofU joint center, \$2 million/yr NSF funding

1997 – NSF funding concludes, new director (Tom Fletcher)

- \$1-2 million/yr funding through individual grants (DOE, NIH, DOD)

2004 – U of U forms separate institute (ICES)

2007 – BYU funding at ~\$2 million/yr

- New initiatives (GCEP, Utah Clean Coal Center, NSF ERC Proposal)

Current ACERC Mission

***To develop advanced combustion technology
through fundamental engineering research
and educational programs
aimed at the solution of critical national problems***





Current Research Interests

Industries

- Electric power
- Chemical processes
- Forest products
- Forest Service
- Solid Waste
- Transportation
- Cement/Concrete
- Glass
- Military (safety)

Fuels

- Coal
- Biomass
- Black liquor
- Petroleum coke
- Hydrogen
- Municipal solid waste
- Natural gas
- Jet & diesel fuel
- Metallurgical coke
- Soot/model hydrocarbons

Subjects

- Combustion/
Gasification
- Ash
Formation, Deposition,
Corrosion, Use
- Soot/Aerosol
formation
- NO_x, SCR
- Mercury emissions
- Heat transfer
(convective, radiative)
- CFD, Fluid/Fixed

**See Poster Session Titles (in program)
for a Complete List of Active Projects**

model computing



Professors Involved

- | | | | |
|---------------------|-----|----------------------|------|
| • Larry Baxter* | ChE | • Jeffrey Bons | ME |
| • Tom Fletcher* | ChE | • Calvin Bartholomew | ChE |
| • Dale Tree* | ME | • Fernando Fonseca | CE |
| • Merrill Beckstead | ChE | • Hugh Hales | ChE |
| • Bill Hecker | ChE | • Reed Izaat | Chem |
| | | • Matt Jones | ME |
| | | • Matt Linford | Chem |
| | | • Dan Maynes | ME |
| | | • John Oscarson | ChE |
| | | • Dennis Tulley | Stat |
| | | • Brent Webb | ME |

*ACERC Executive Committee





Who Really Does The Work

(at BYU)

- 25 Graduate Students
- 23 Undergraduate Students
- 1 Postdoc & 1 Research Associate
- Carina Alleman (secretary)

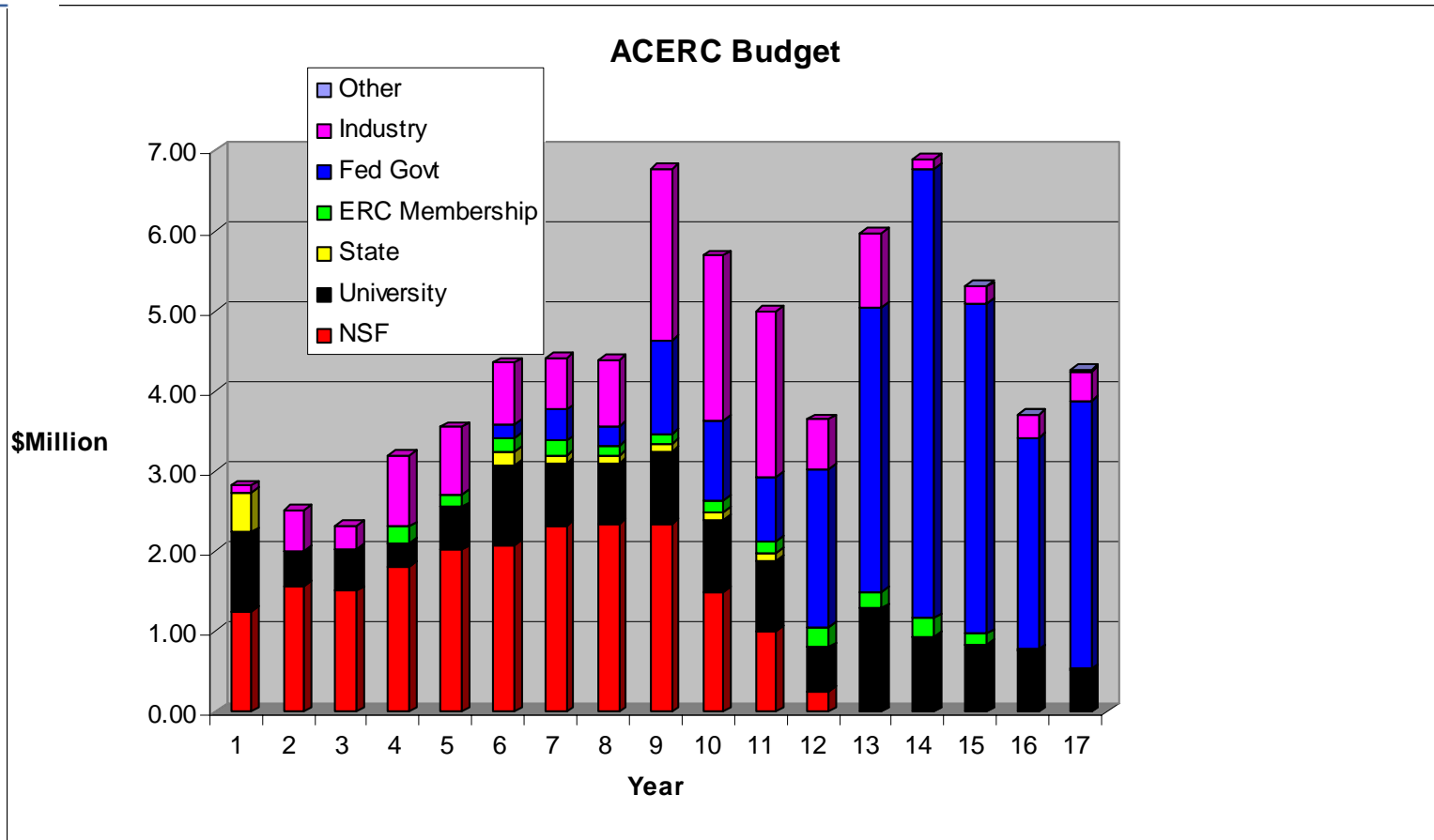


Graduate students receiving degrees in 2006:

- **Chunyang Wu, PhD ChE (REI) – NO_x Formation from Biomass**
- **Hong Lu, PhD ChE (GE Global Research) – Particle Reactivity**
- **Warren Roberts, MS ChE (ExxonMobil) – Particle Reactivity**
- **Xiaoyu Guo, PhD ChE (Babcock & Wilcox) – SCR Performance**
- **Brian Critchfield, MS ChE (ConocoPhillips) – FT Catalysts**
- **Andrew Mackrory, MS ME (PhD-BYU) – Black Liquor Spray**
- **Mark Woodruff, MS, ME (Textron) - Fluidized Bed, Black Liquor**

ACERC Joint Research Funds

BYU & UofU, 1987-2002

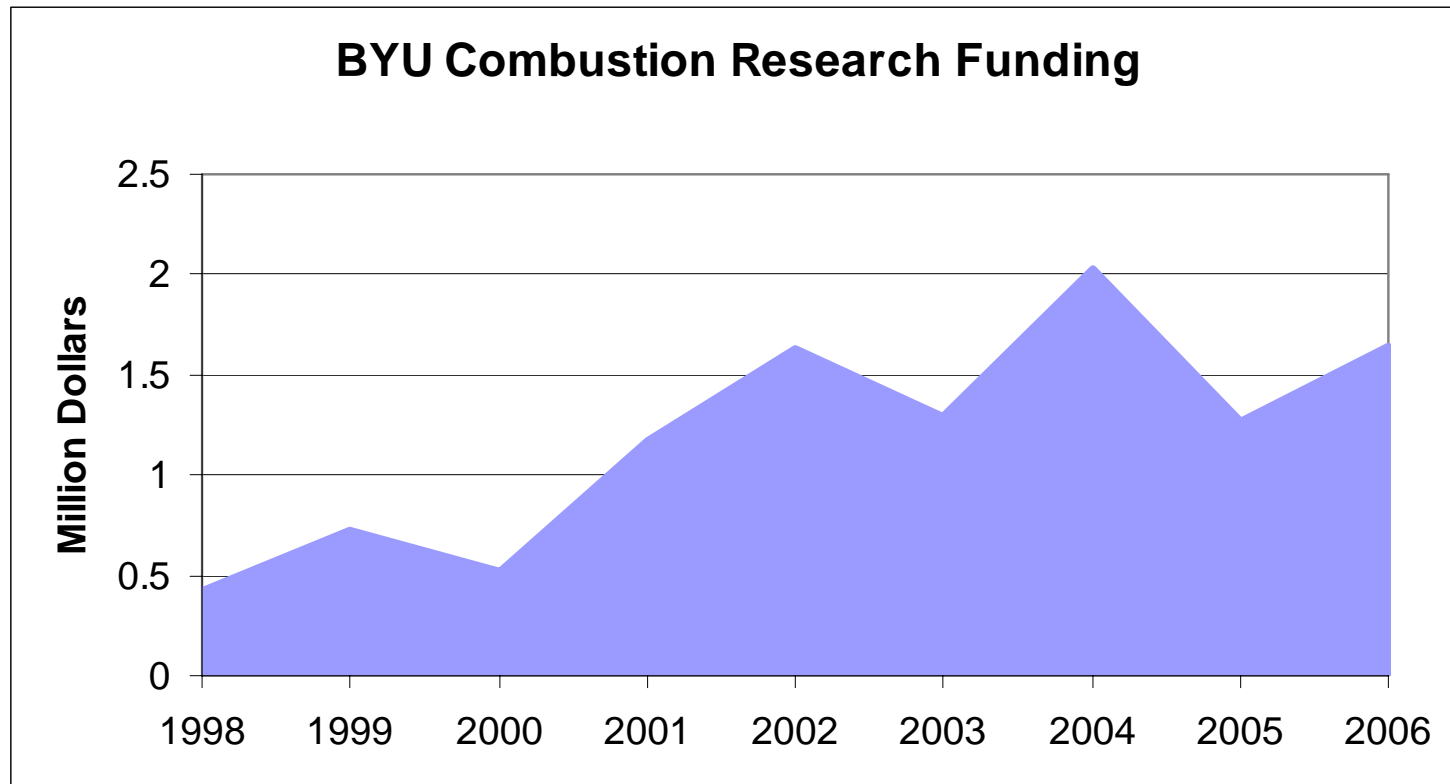


Over \$75 million in research over 17 years!



BYU Combustion Funds

1998-2006



- Maintaining an active research program
- Most funding goes to students



Current Industrial Members

- **American Air Liquide**
- **Alstom Power**
- **Babcock & Wilcox**
- **Praxair**
- **Reaction Engineering International**



Membership Benefits

- **Access to students**
- **Joint proposals**
- **Influence direction of large & energetic research program**
- **Receive rapid feedback regarding current work**
- **Use of facilities/computers as visiting scientist**
- **Copies of theses and dissertations**
- **Publication lists**
- **Student resumes**
- **Highly discounted license for software**
- **Coordination of student internships/co-ops**
- **Tax deductible**
- **Reduced fees to annual ACERC conference**
- **Voice at members' luncheon**

Cost: \$5K/yr



Industrial Participants

(ACERC annual conference participants, 2005-2006)

Alion Science & Technology	EPRI	Reaction Engineering International*
Alliant Energy	Flying J Inc.	RMT Inc.
Alstom Power*	GCEP, Stanford University	Sandia National Laboratories
American Air Liquide*	Headwaters	Southern Company
ATK Thiokol	Johnston Boiler Co.	Stanford Univesity
Babcock & Wilcox*	Los Alamos National Laboratory	T.R. Miles
Battelle Energy Alliance (Emery Energy)	Materials and Systems Research, Inc.	US DOE
CEntry Construction & Engineering	Pacificorp	UT Div of Public Utilities
Combustion Resources	Praxair*	Wheelabrator Technologies

Detroit Stoker Co.

***Current ACERC Industrial Members**



News



- **Merrill Beckstead receives Utah Governor's Medal for Science & Technology 2006**



- **Cal Bartholomew honored with special session at ACS Meeting**
 - Retiring in 2008
 - Starting Fischer-Tropsch Consortium



- **Jeffrey Bons (ME) moving to Ohio State, 2007**



- **JoAnn Lighty is new Department Chair, Chemical Engineering at U of Utah, 2007**



New Large Initiatives

1. NSF ERC Proposal

- Sustainable Energy
- Headed by Larry Baxter
- Stanford, U of Utah

2. GCEP

- Joint Stanford-BYU-U of U proposal accepted

3. U of Utah Clean Coal Center

4. Industrially-funded Fundamental Research

- Deposition
- Gasification
- Biomass
- Oil Shale

AIChE National Meeting

November 4-9, 2007

Salt Palace, Salt Lake City



Session	Chair	Co-Chair
Advanced Modeling Methods in Carbon Dioxide Sequestration	Milind Deo	Brian McPherson
Advances in Gasification Research	Kevin Whitty	Thomas H. Fletcher
Fluidization and Energy Production	Jennifer S. Curtis	Philip J. Smith
Mercury Abatement in Combustion and Gasification	Geoffrey Silcox	Jost O. L. Wendt
Oil Characterization and Thermodynamics as Related to Flow Assurance	Jules Magda	Milind Deo
Oil Shale and Oil Sands	Philip J. Smith	
Organic Solar Cells	Huisheng Peng	Lei Fu
Oxycombustion of Coal – Needs, Opportunities, and Challenges	Arun C. Bose	Eric G. Eddings



2007 Conference Agenda

Thursday Morning

Chair: *Tom Fletcher*

- **Towards Sustainable Energy**

Thursday Noon

- **Member Luncheon**

Thursday Afternoon

Chair: *Matt Jones*

- **Towards Sustainable Energy**
- **Discussion of Future Directions (3-4 pm)**

Thursday Evening

- **Student Posters (4-6 pm)**

Friday Morning

Chair: *Dale Tree*

- **Advances in Chemical Characterization**
- **Model Development & Application**

Friday Afternoon

Chair: *Larry Baxter*

- **Model Development & Application**