

Undergraduate Research Opportunities in Physics

USU SPS March 11, 2010

Why Should I do Research?

- You can't know what science is until you actually do some
- It's *mandatory* if you want to compete successfully for national scholarships & awards
- It's *mandatory* if you want to compete successfully for a job or for admission to graduate school
- LETTERS, LETTERS, LETTERS!
- Best of all: Doing research is exciting and fun

How do I get Started?

- Read the Department UROP handout
- Identify an area of interest
- Introduce yourself to the mentor explaining your interest
- Bring a CV indicating what skills you possess
- Be prepared to work your way up

How do I Succeed?

- Be brave, don't fear failure
- Take OWNERSHIP!
 - Become a creative contributor
- Go to conferences, make presentations, tell others what you've done (your mastery will increase)

Opportunities in the Department

FAST: Fields, Astrophysics, and Spacetime Theory



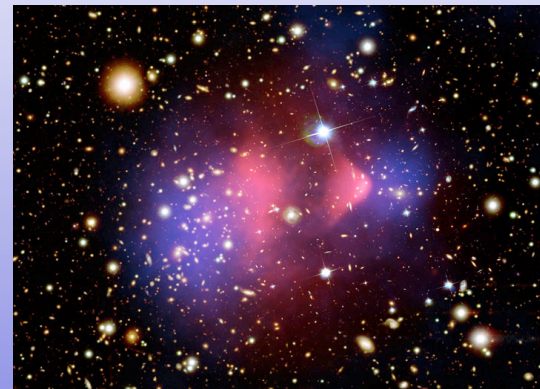
Shane Larson



Charlie Torre



Jim Wheeler



FAST

Observation

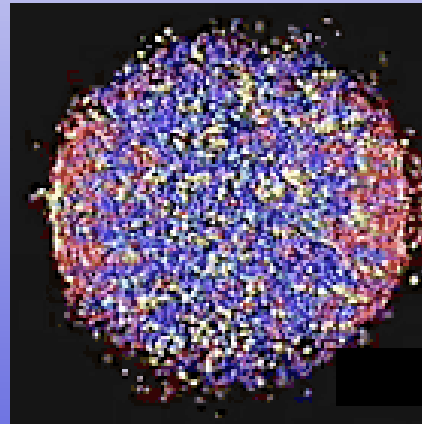
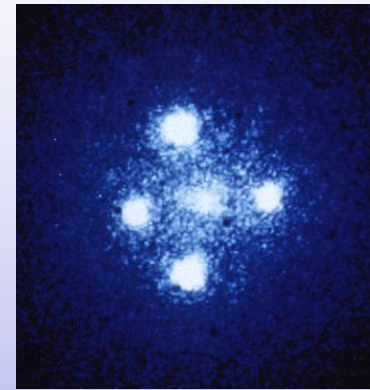
- Visible
- Radio
- Balloons



FAST

Theory

- General Relativity
- Quantum Field Theory
- Mathematical Physics



FAST

Notable Alums

- Lara Anderson
- Jamie Jorgensen
- Sidney Chamberlin



CSAA: Center for Surface Analysis and Applications



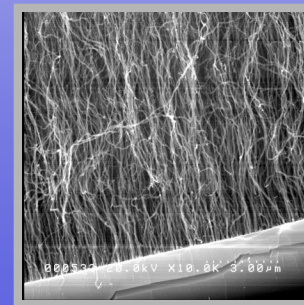
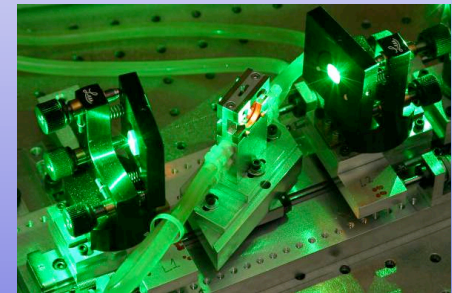
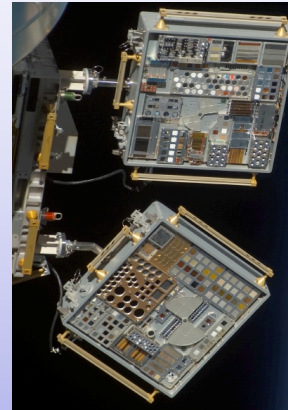
JR Dennison



Mark Riffe



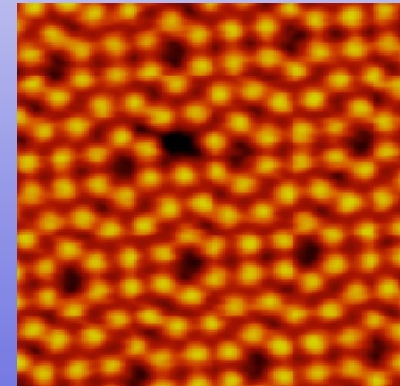
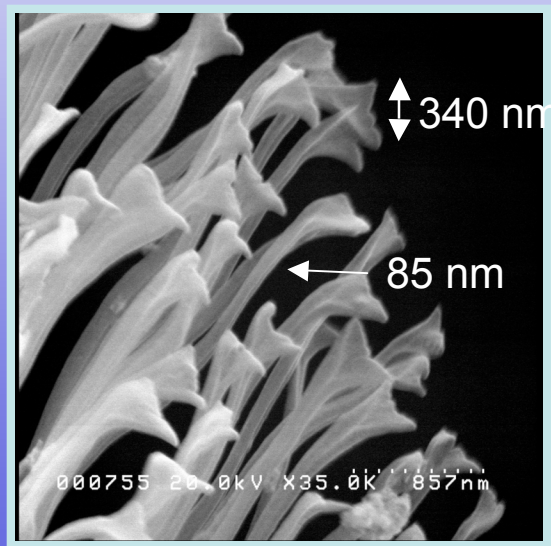
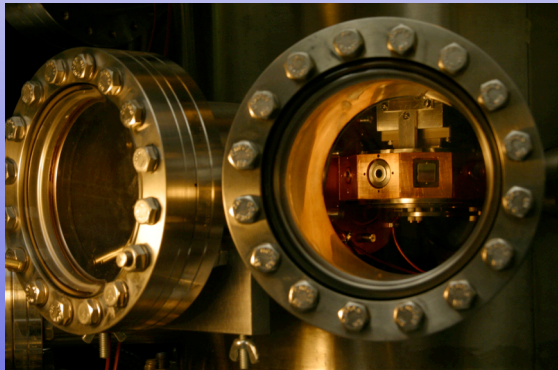
TC Shen



CSAA

Experiment & Theory

- Electron transport & emission
- Ultrafast dynamics in semiconductors
- Carbon nanotubes & adhesion

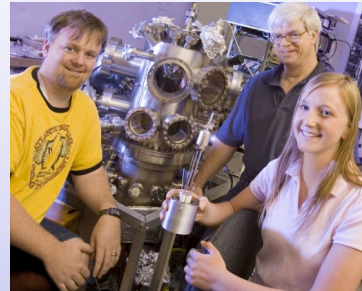


Sp8-18

CSAA

Notable Alums

- Jennifer Albretsen Roth
- Ryan Hoffman
- Steve Hart
- Rich Wilson
- Jeri Brunson
- Sterling Smith
- Jodie Corbridge



CASS: Center for Atmospheric & Space Science



Bela Fejer



Jan Sojka



Ludger Scherliess



Mike Taylor



Bob Schunk

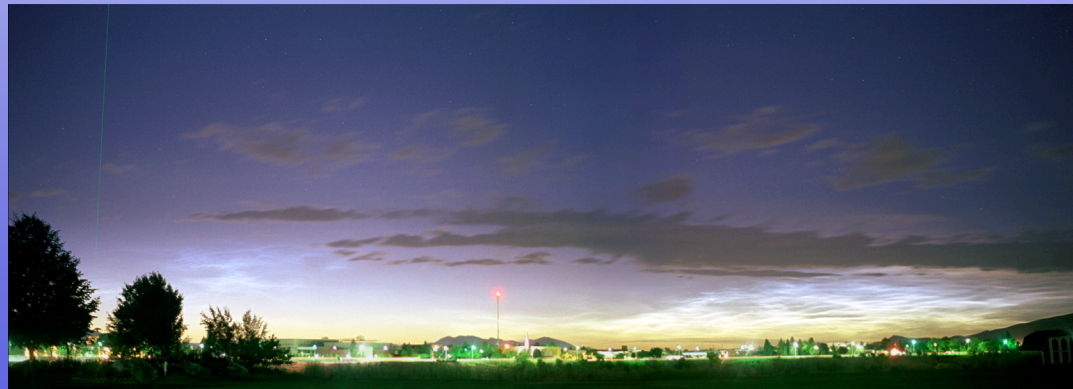


Vince Wickwar

CASS

Instrument Design & Observation

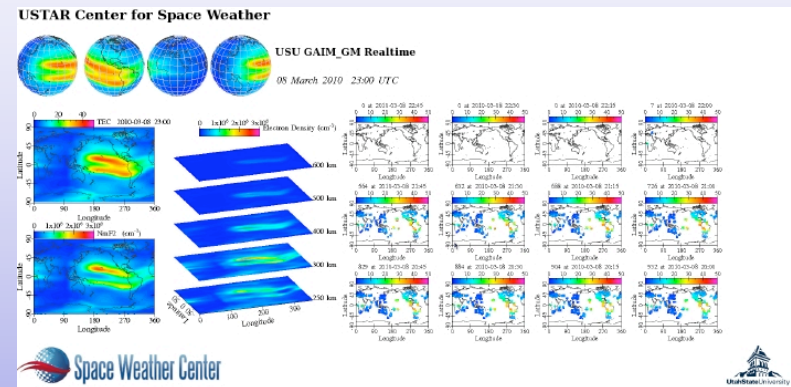
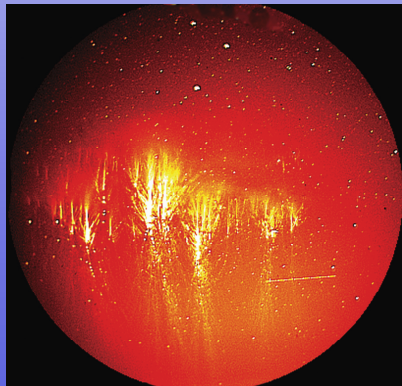
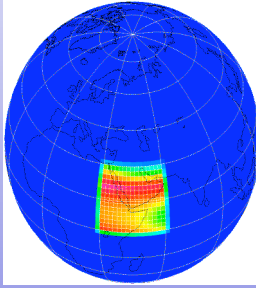
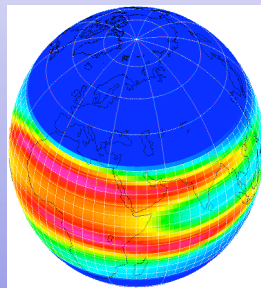
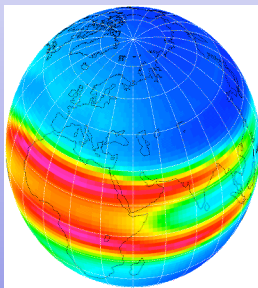
- Digital & video imaging systems
 - Sprites, Elves
 - gravity waves, meteors ...
- LIDAR
 - temperatures, densities, waves in mesosphere



CASS

Space Weather

- Forecasting models
- Ground-based radar



CASS

Notable Alums

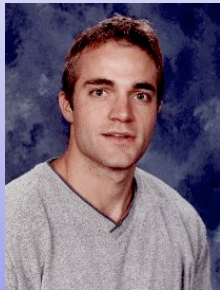
- Jodie Barker-Tvedtnes
- Jan Marie Andersen
- Chris Olsen



Fusion Plasmas



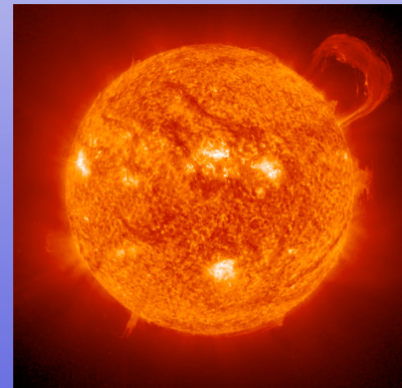
Farrell Edwards



Eric Held



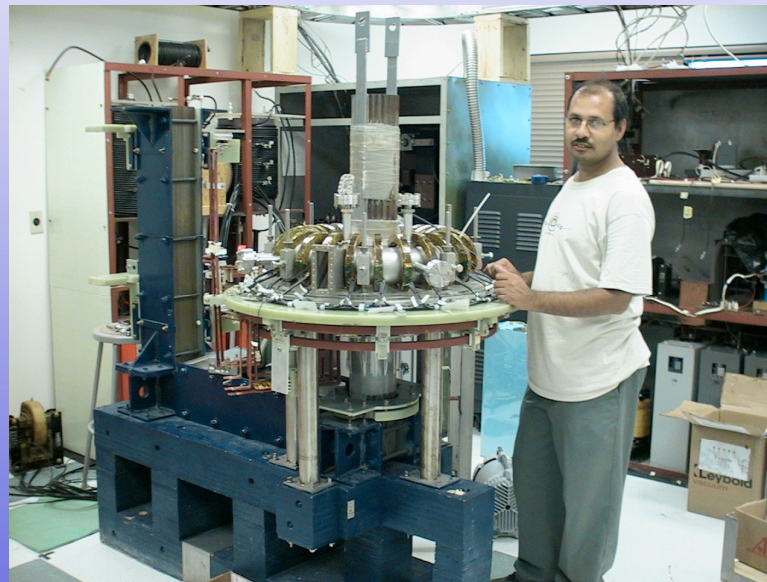
Ajay Singh



PLASMA

Experiment & Theory

- Dynamical modeling
- USU Tokomak



PLASMA

Notable Alum

- David Hatch



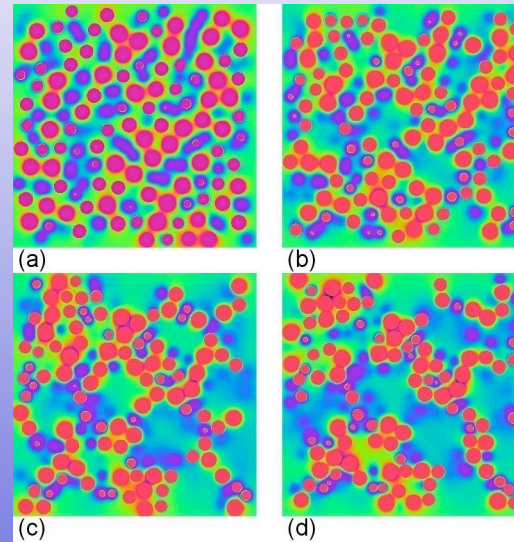
Complex Materials & Dynamics



Tim Doyle



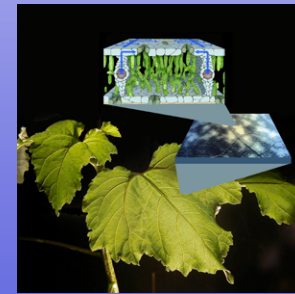
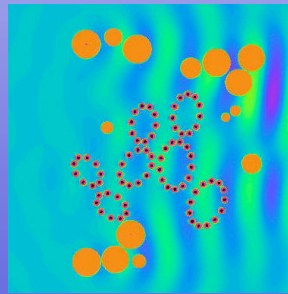
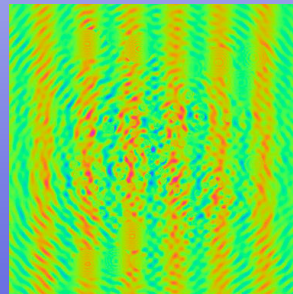
David Peak



COMPLEX

Theory

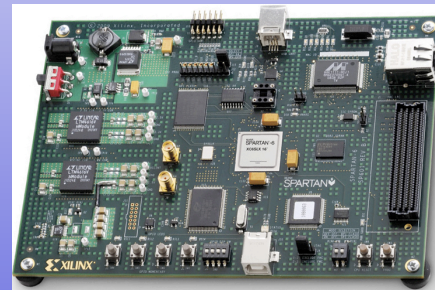
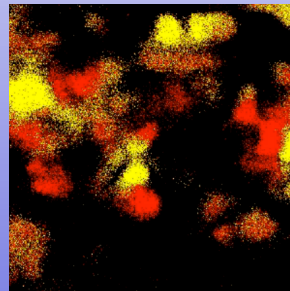
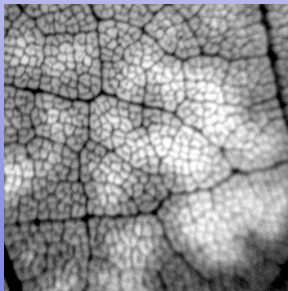
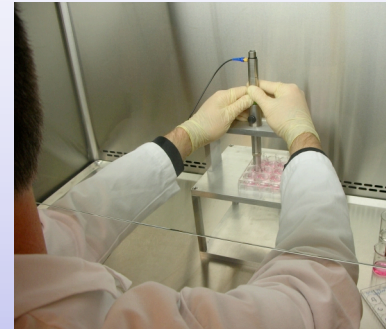
- Modeling waves in granular systems & biological tissue
- Modeling heat deposition for tissue ablation
- Modeling computation in plants



COMPLEX

Experiment

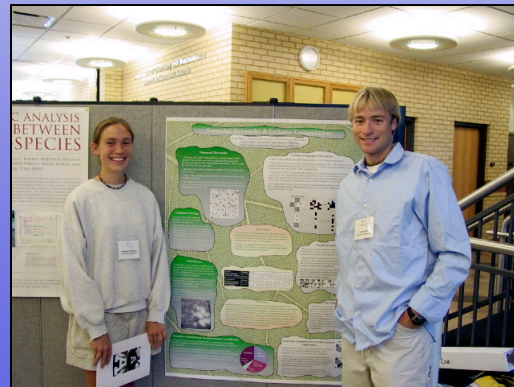
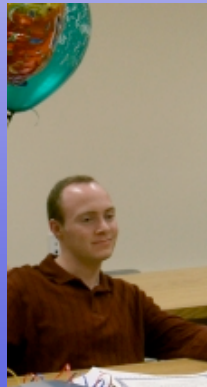
- Tissue cultures
- Stomatal patchiness
- Circuits that mimic biology



COMPLEX

Notable Alums

- Paul Simonson
- Richard Datwyler
- Susanna Messinger
- Jevin West
- Keith Warnick



Get Away Special Research Team



Meets every Wednesday
at 5 PM in SER244



- USU's most prominent student academic organization
- 20-30 volunteer researchers
- all majors welcome
- devise, design, build, fly, and analyze experiments in space and zero-g
- outreach to local grade schools
- many "alumni" employed in aerospace industry

Beyond USU Physics

- Employment at SDL
- NSF REU program
- DoE SULI program
- Industrial internships

What are You Waiting for???

Who's Who

Lara Anderson	Goldwater, Rhodes, NSF Fellow, PhD Oxford
Jamie Jorgensen	Goldwater, PhD Rice
Sydney Chamberlin	Goldwater*, Rhodes*, SPSOUR*, COSOUR, PhD Wisconsin†
Jennifer Roth	Goldwater, PhD Oregon St†
Ryan Hoffman	1st Prize Small Sat Student Paper
Steve Hart	PhD Wisconsin†
Rich Wilson	PhD Illinois†
Jeri Brunson	NASA Fellow, PhD USU
Sterling Smith	DoE Fellow, PhD Princeton†
Jodie Corbridge	Posters on Hill
Jodie Barker-Tvedtnes	Goldwater, SPSOUR, SPS Leader, PhD UCLA†
Jan Marie Andersen	Fulbright, COSOUR, PhD Boston U†
Chris Olsen	Posters on Hill, officer US Navy
David Hatch	Goldwater, COSOUR, PhD Wisconsin†
Paul Simonson	Posters on Hill, PhD Illinois†
Richard Datwyler	Posters on Hill, PhD USU†
Susanna Messinger	PhD Michigan†
Jevin West	PhD Washington†
Keith Warnick	Goldwater*, PhD Vanderbilt†

SPSOUR = Society of Physics Students (SPS) Outstanding Undergraduate Researcher

SPS Leader = National SPS Leadership Scholar

COSOUR = College of Science Outstanding Undergraduate Researcher

Small sat = AIAA Small Satellite national Conference

Posters on Hill = Council on Undergraduate Research Student Posters at National Capitol

* = honorable mention

† = still a student