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Excellent Adventures in Global Collaboration


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Excellent Adventures in Global Collaboration NCSSSMST October 2011



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Evan Glazer
Aracelys Rios

International Student Collaboration



Sponsors of Tomorrow.™

CoolHub.IMSA

Collaborative Networks to Fast Forward Innovation in STEM Teaching and Learning



Rationale for Collaborative Research

- Global problems require global solutions
- Greater insight into problems through variety of resources
- Increased capacity - more hands and heads
- Reliance on relative strengths: equipment, human, and geographic resources

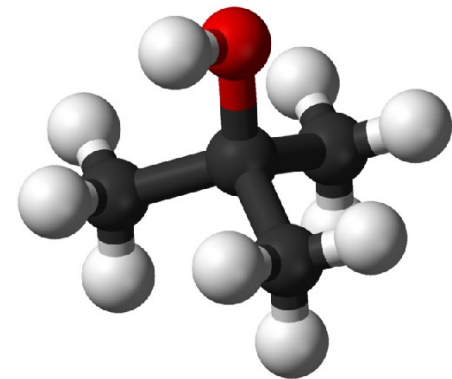
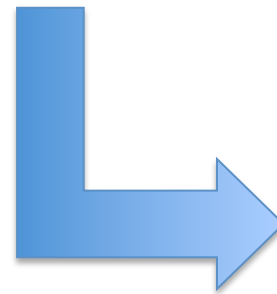


Collaborative Research Projects for NCSSSMST Students: Multisite Data Collection and Collaboration



Our Student Research Projects: Sustainable Energy Themes

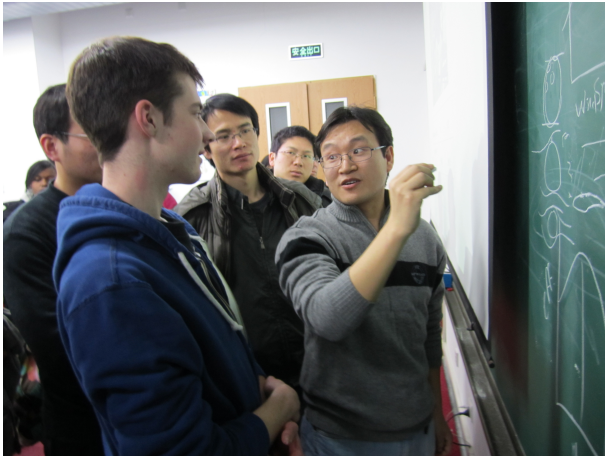
- Production of advance biobutanol from Miscanthus
- Developing efficient turbines for light winds (4m/s)



Each School Provided Resources ...

- Videoconferencing
- Lab equipment
- Human experts
- Commitment to carry out experiments

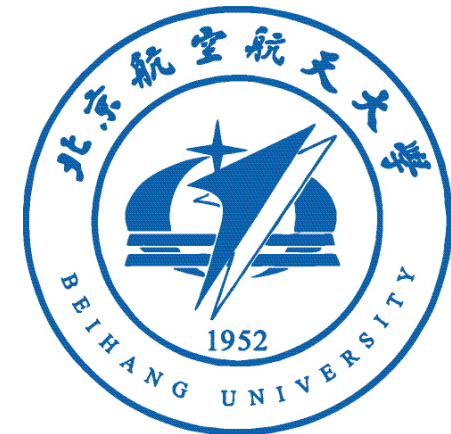




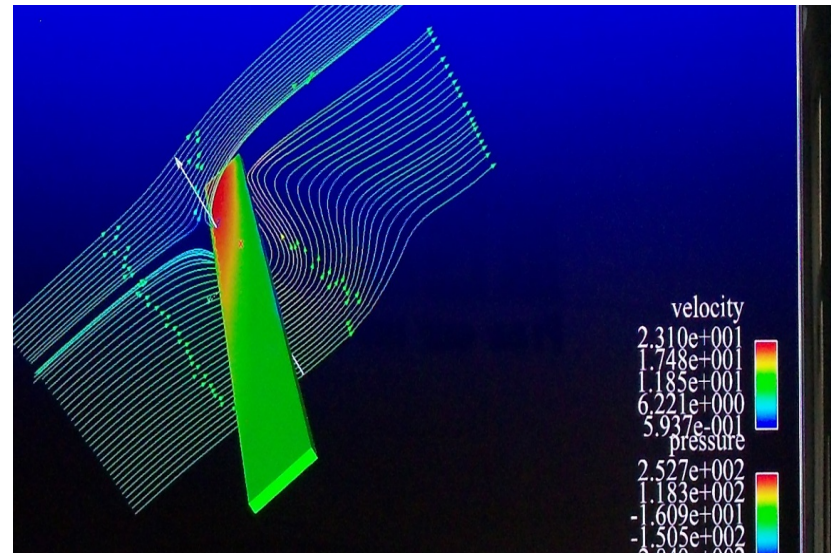
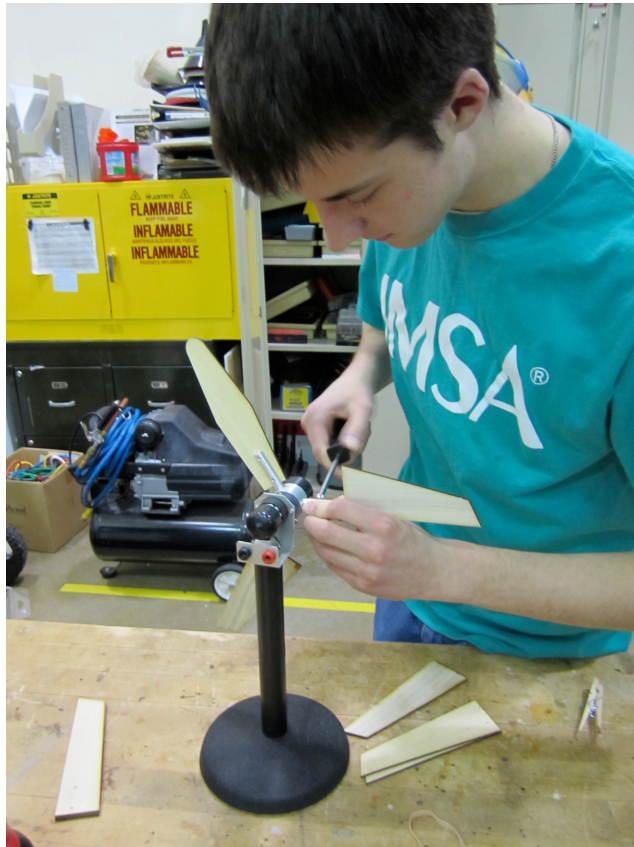
... and Enlisted Key Partners



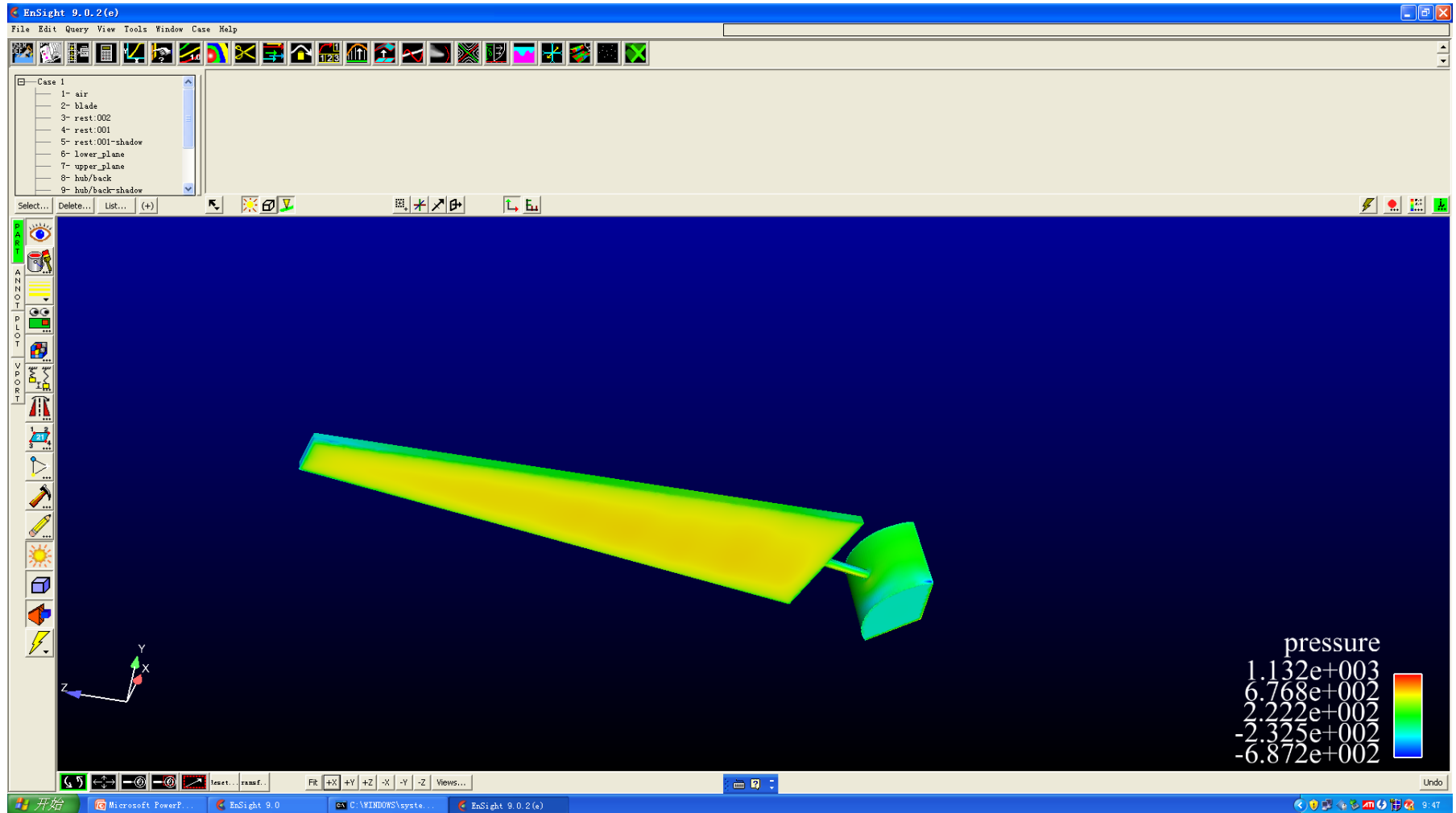
Raytheon

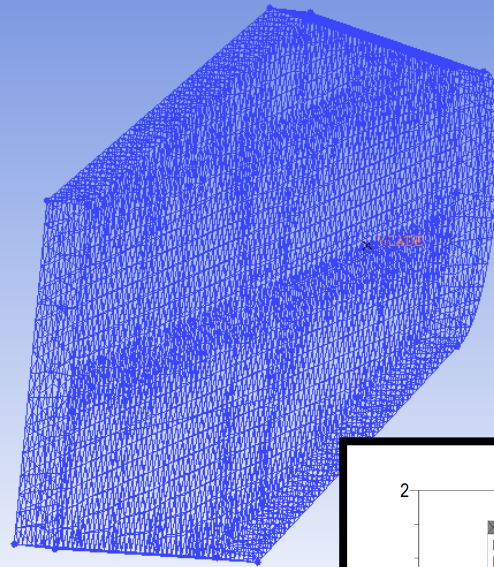


Wind Turbines for “Gentle Breezes”

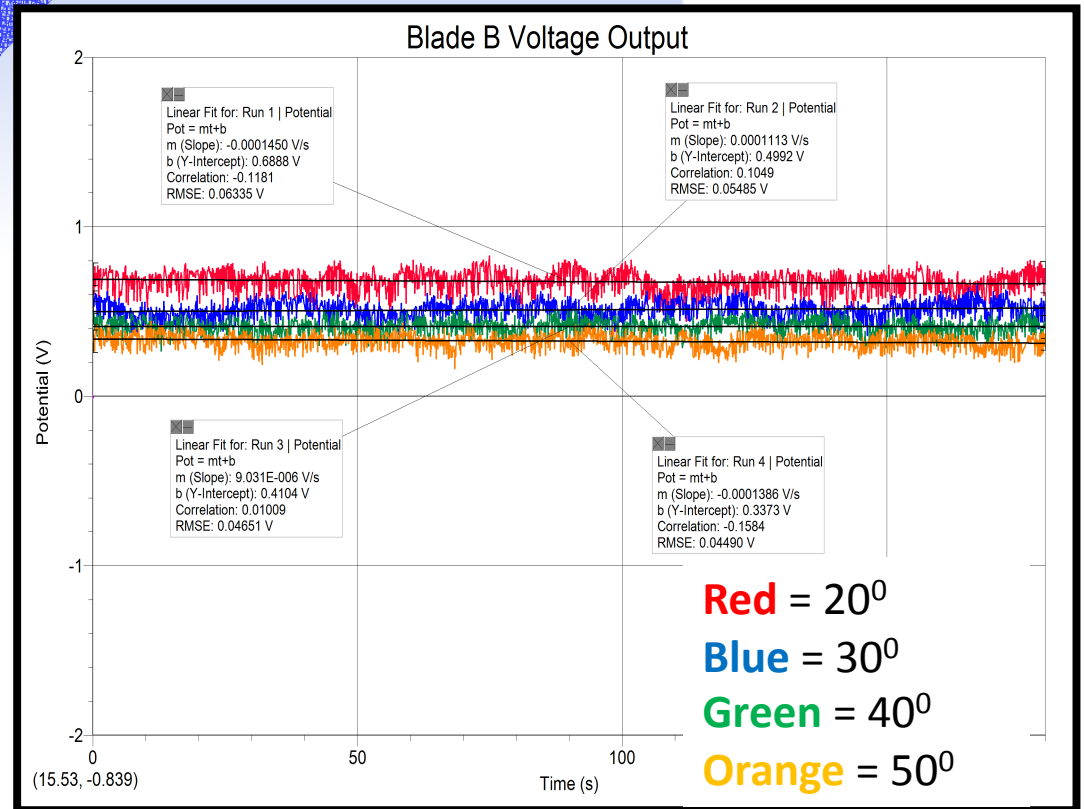


效果图(Effects)

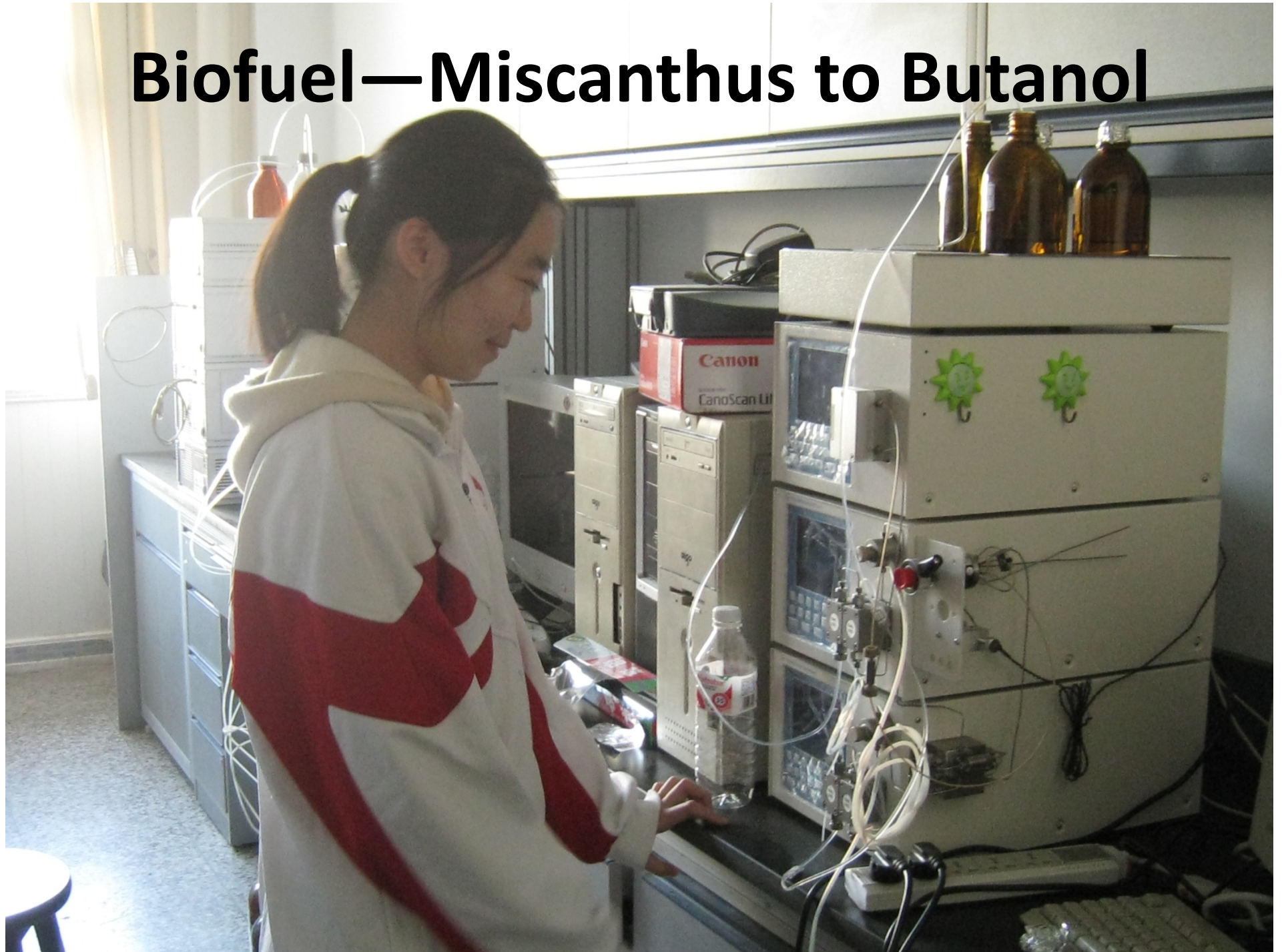




Blade Angle	Power A	Power B
10	.296	.301
20	.718	.590
30	.704	.854
40	.836	.102
50	1.026	.0112

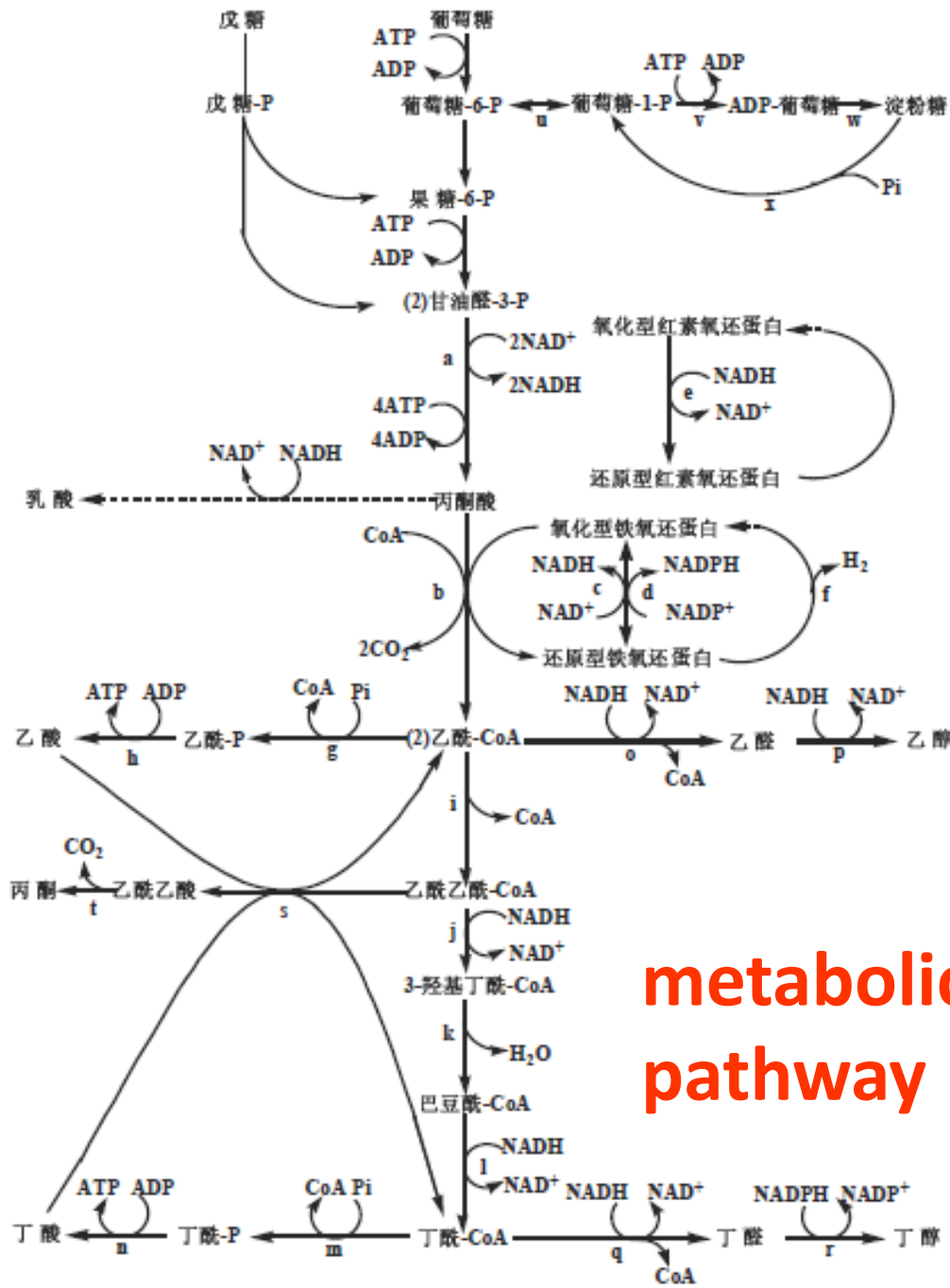


Biofuel—Miscanthus to Butanol

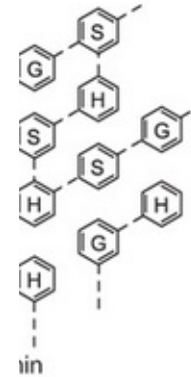


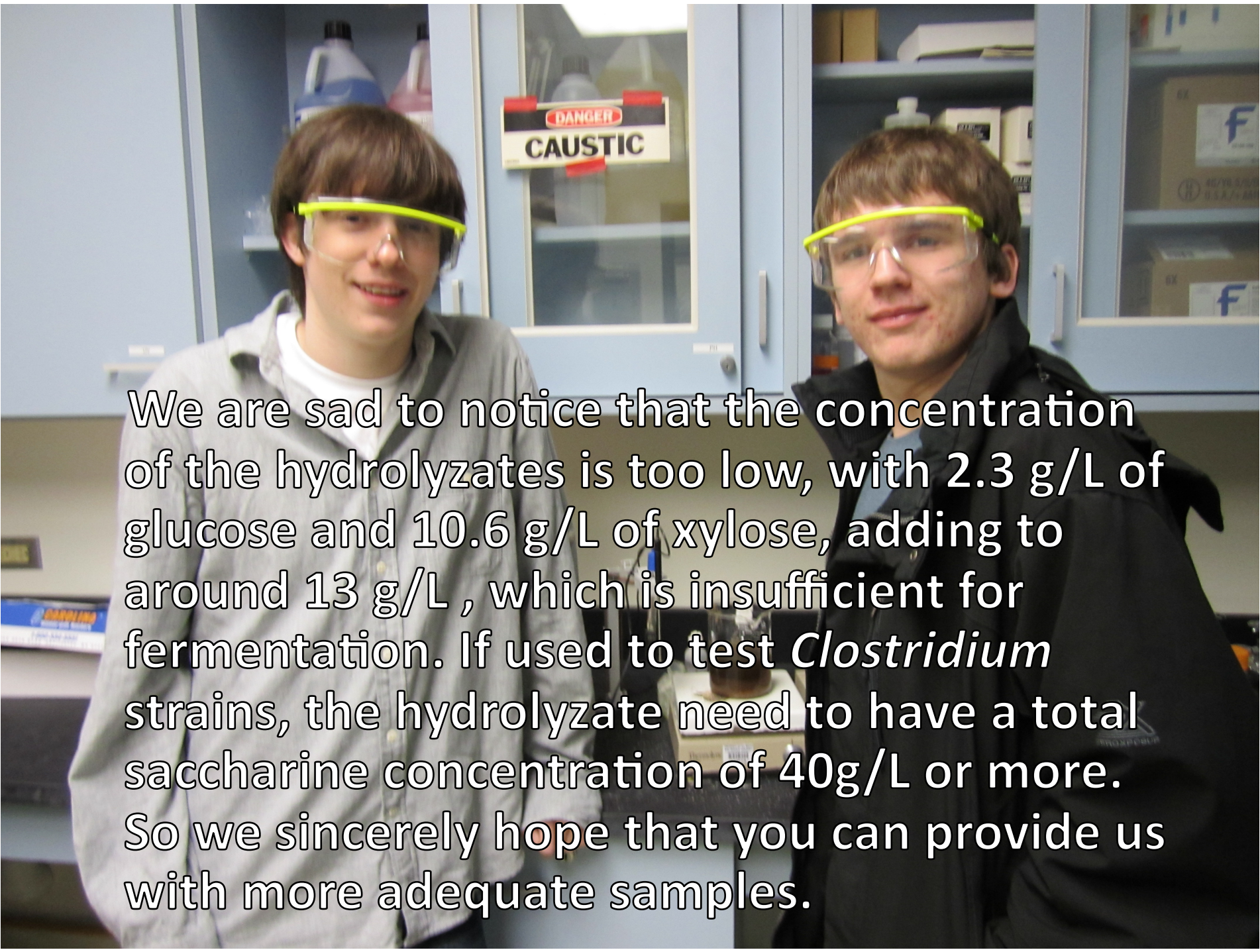
Miscanthus to Butanol

- Miscanthus hydrolyzate will be prepared by the US students and posted to RDFZ student group. The concentration of glucose and xylose as well as other sugars will be analyzed by HPLC in a US laboratory.
- RDFZ students will grow different *Clostridium* strains in miscanthus hydrolyzate prepared by US students.
- The metabolites spectrum of *Clostridium* strains grown in miscanthus hydrolyzate will be analyzed in China.
- Strains exhibiting the best performance of utilizing the fermentable sugars in miscanthus hydrolyzate for biobutanol production will be selected for potential industrial producers.



metabolic pathway



A photograph of two young men in a laboratory setting. They are both wearing clear safety goggles with bright yellow-green frames. The man on the left is wearing a light grey button-down shirt over a white t-shirt. The man on the right is wearing a dark jacket. In the background, there are blue lab cabinets. A prominent sign on the cabinet door reads "DANGER CAUSTIC" in red and black. There are also some boxes and bottles on the shelves behind them.

We are sad to notice that the concentration of the hydrolyzates is too low, with 2.3 g/L of glucose and 10.6 g/L of xylose, adding to around 13 g/L , which is insufficient for fermentation. If used to test *Clostridium* strains, the hydrolyzate need to have a total saccharine concentration of 40g/L or more. So we sincerely hope that you can provide us with more adequate samples.

CoolHub Platform

The screenshot displays the CoolHub.IMSA website interface. At the top, the navigation bar includes "Project Public View" and "Members Area". The breadcrumb trail shows "CoolHub.IMSA > International Collaborative Sustainable Energy Project - Proposals > Project Public View".

The main content area is divided into two panels:

- Project Information:** Features a video titled "International Collaborative Sustainable Energy Project" showing students and faculty. Below the video, text states: "Students and faculty from the Illinois Mathematics and Science Academy (IMSA), Thomas Jefferson High School for Science and Technology (TJ) and the High School Affiliated with Renmin University in Beijing (RDFZ) are establishing an international collaborative research study of sustainable energy sources." Below this text are five stage buttons labeled "Stage 1" through "Stage 5", with "Stage 4" highlighted.
- Project Blog:** Contains a post titled "Video Conference -- Our Student Research Collaborative Welcomes INTEL" dated 7/11/11 11:35 AM. The post includes links for "Edit", "Permissions", and "Delete". The text of the post reads: "Our next videoconference is scheduled for 8:30 a.m., Monday, July 18, Beijing time. As the agenda below indicates, we will share results of our survey, hear research updates, discuss future exchanges and welcome our special guest from the Intel Foundation, Ms. Shelley Esque, who is visiting RDFZ." The agenda includes: "Download Agenda", "Thomas Jefferson Teknos article about wind project: Download Thomas Jefferson Teknos Article about wind project", "IMSA Biofuel Poster: Download IMSA Biofuel Poster", "IMSA Biofuel Paper: Download IMSA Biofuel Paper", "IMSA Biofuel Presentation: Download IMSA Biofuel Presentation", "Wind Turbine Presentation: http://coolhub.imsa.edu/cybercollab/documents/126315/c383b73b-6c91-4b49-95dc-6447ecbad3b8", and "End of project survey results: Download end of project survey results".

The bottom of the browser window shows the Mac OS X dock with various application icons and system status icons in the top right corner.

CoolHub: More than Video Conferencing

Doc Libraries - CoolHub.IMSA

coolhub.imsa.edu/group/international-alternative-energy-projects-proposals/documents

Doc Libraries

Document Library

Documents Home | Recent Documents | My Documents

Search

▼ Folders

Name	# of Folders	# of Documents	Actions
Agendas Agendas from our videoconferences	0	3	Actions
Biodiesel Project Docs	0	2	Actions
Final Presentation Docs	0	4	Actions
Final Research Documents Final collection of all submitted documents.	0	3	Actions
Meeting Notes	0	4	Actions
Presentations	0	15	Actions
Proposals	0	13	Actions
Surveys Project Surveys	0	1	Actions
Wind Turbine Project Docs	0	3	Actions

Showing 9 results.

▼ Documents

Image Gallery

Images Home | Recent Images | My Images

Search

▼ Folders

Folder	# of Folders	# of Entries	Actions
CoolHubImages Images to be used on other parts of the site	0	2	Actions
General Images	0	6	Actions
Project Banners	0	1	Actions
Images	0	28	Actions
Collaborative Energy Project Images from Collaborative Energy Project Subfolders: proposals	1	17	Actions

Showing 5 results.

▼ Images

There are no images in this folder.

Permissions

- Add Folder
- Add Document
- Add Shortcut
- Access from Desktop

Images Home

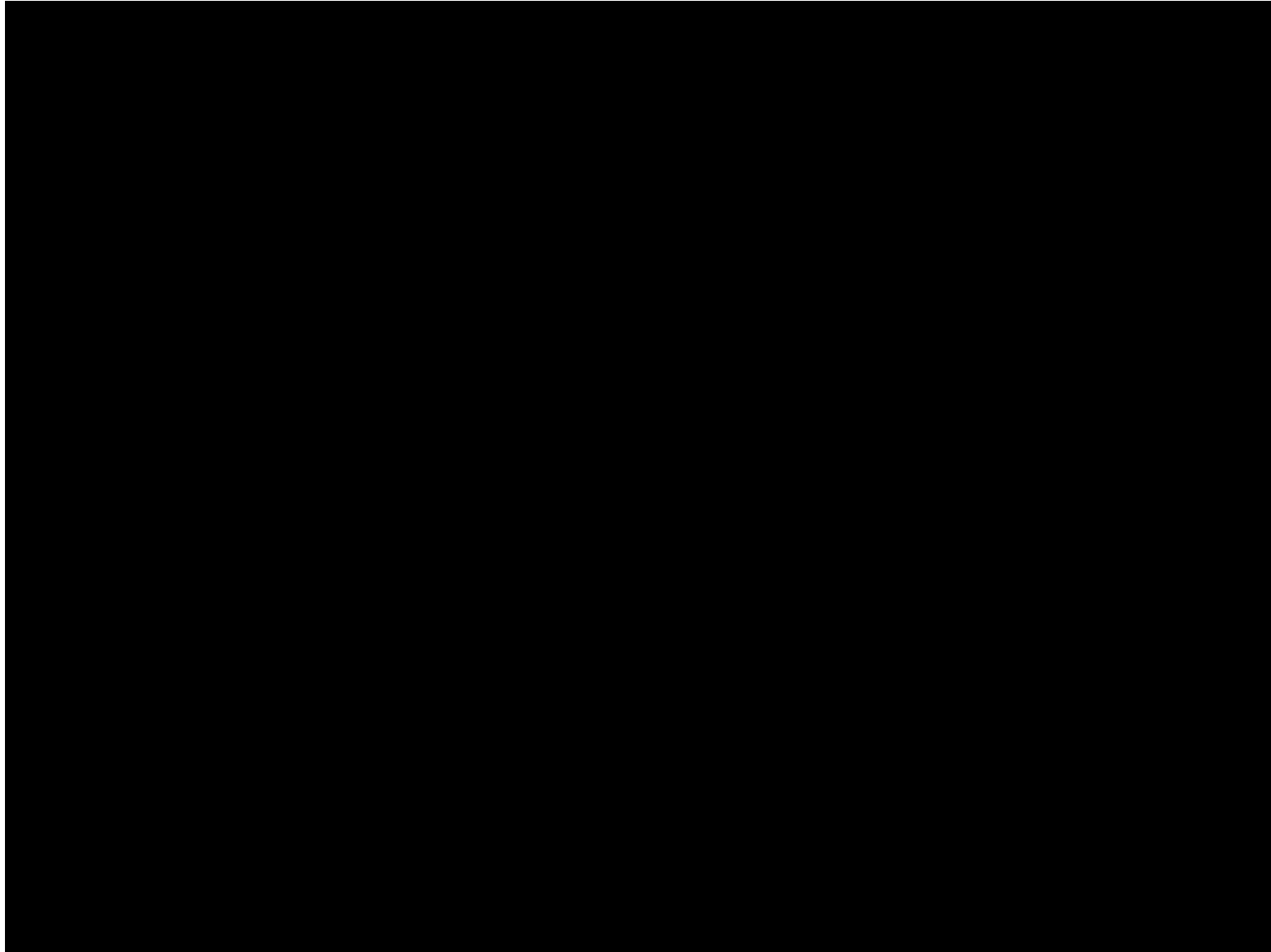
- Permissions
- Add Folder
- Add Image
- Access from Desktop

Settings Online Friends (0)

Dr. Joseph Wise

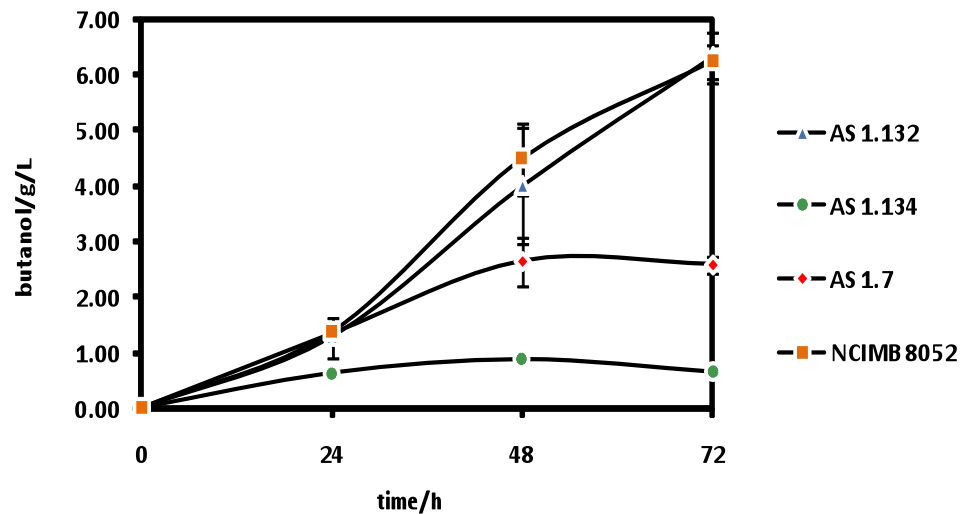
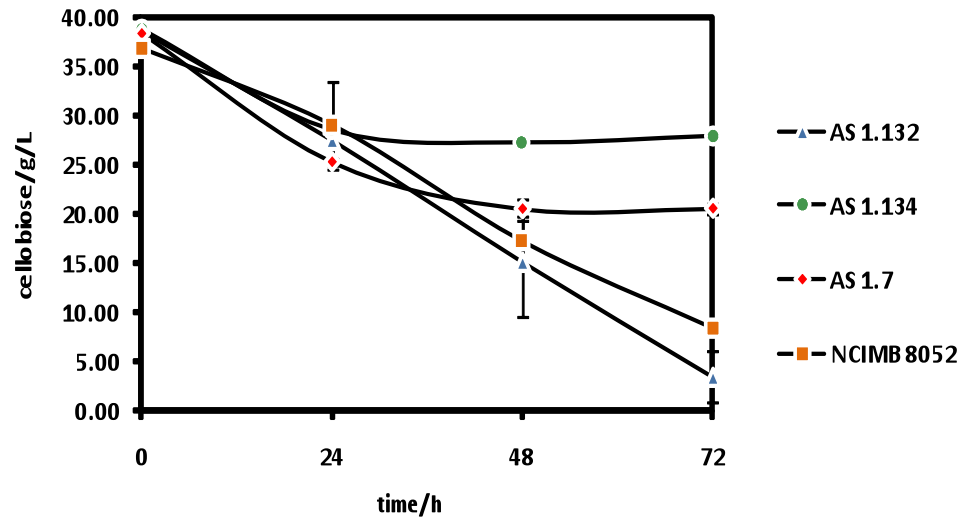
Re: Sneaker for the vision work

Research in Action



Outcomes

- Cognitive
- 21st Century Skills
- Unanticipated Benefits



IMSAlloquium



Outcomes

- Cognitive
- **21st Century Skills**
 - Collaboration rather than competition
 - Problem solving and critical thinking
 - Global citizenship
 - International research networks
 - Generating new knowledge and products
- Unanticipated Benefits



Outcomes

- Cognitive
- 21st Century Skills
- Unanticipated Benefits
 - Friends and Finals
 - Professional Learning
 - Networking
 - [Notoriety](#)



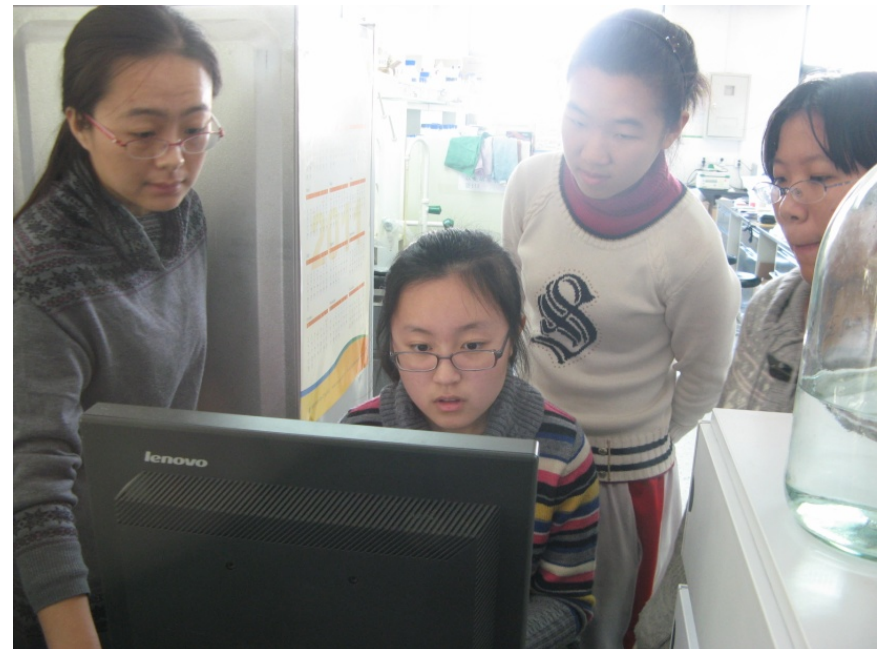
Challenges

- Aligning different research timelines
- Finding good times to communicate
- Funding sources



Lessons Learned

- Balance between staff involvement and student involvement
- Students check each other's work like a Wikipedia page
- Our work is limited: We need to extend this collaboration network



United Nations of Youth

Inspiring Collaboration... Advancing the Human Condition... Creating World Peace



CoolHub.IMSA

Collaborative Networks to Fast Forward Innovation in STEM Teaching and Learning



**J.F. Rischard: *High Noon: 20 Global Problems and 20 Years to Solve Them*
— We Need NCSSSMST's Best Minds**

- Global Warming
- Deforestation
- Water deficits
- Fishery Depletion
- Poverty
- Natural disaster prevention and mitigation
- Intellectual property rights



Defining the Future Truly Is an Excellent Adventure



Please become one of our teaching and learning laboratories, as we develop a pioneering global network for collaborative student research.

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- jgerry@imsa.edu
- EMGlazer@fcps.edu

