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## EWGP--a work in progress....

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Presentation for *The Search for a Sustainable Energy Future: Challenges for Basic Research*, A Mini-Symposium sponsored by the Energy Working Group at Penn, March 9, 2007.

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### **Abstract**

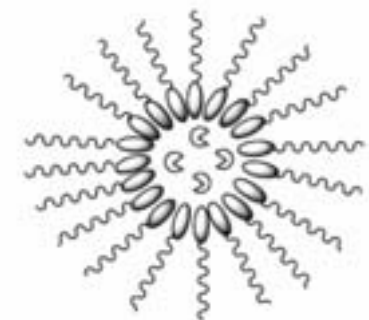
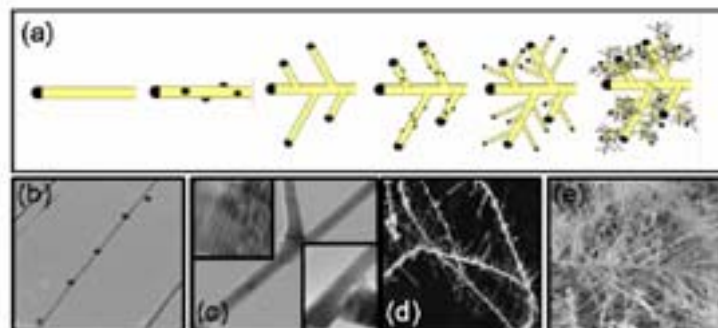
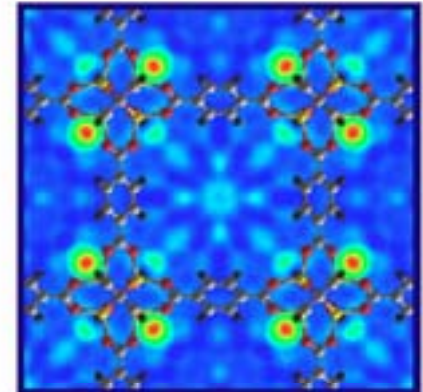
The need for energy affects almost every aspect of modern society. Indeed, the advent of coal as a widely-used energy source is sometimes viewed as the spark that started the Industrial Revolution. However, we are about to enter a new era due to increased competition from developing nations for the world's dwindling energy supplies and to the growing recognition that our current energy usage is unsustainable and is affecting the world's climate. It is apparent that research on energy-related issues will become increasingly important in the coming years.

### **Comments**

Presentation for *The Search for a Sustainable Energy Future: Challenges for Basic Research*, A Mini-Symposium sponsored by the Energy Working Group at Penn, March 9, 2007.

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The need for energy affects almost every aspect of modern society. Indeed, the advent of coal as a widely-used energy source is sometimes viewed as the spark that started the Industrial Revolution. However, we are about to enter a new era due to increased competition from developing nations for the world's dwindling energy supplies and to the growing recognition that our current energy usage is unsustainable and is affecting the world's climate. It is apparent that research on energy-related issues will become increasingly important in the coming years.



# EWGP – a work in progress....

ENERGY - an important societal issue with lots of sci/tech challenges

- very high student interest; boost sci/eng enrollments?
- lots going on at Penn already, mostly in isolation.

EWGP - an informal group of interested faculty members

GOALS - mutual education, appreciation for the “big picture”;

- encourage new collaborations, joint proposals.

FUTURE? - seek block funding

- education programs at all levels; IGERT etc.
- industrial partnerships
- include environmental & earth sciences, geology, to address challenges in remediation, sequestration, Landsat image analysis etc.
- connect with public policy, economics, law, business, entrepreneurship, .....

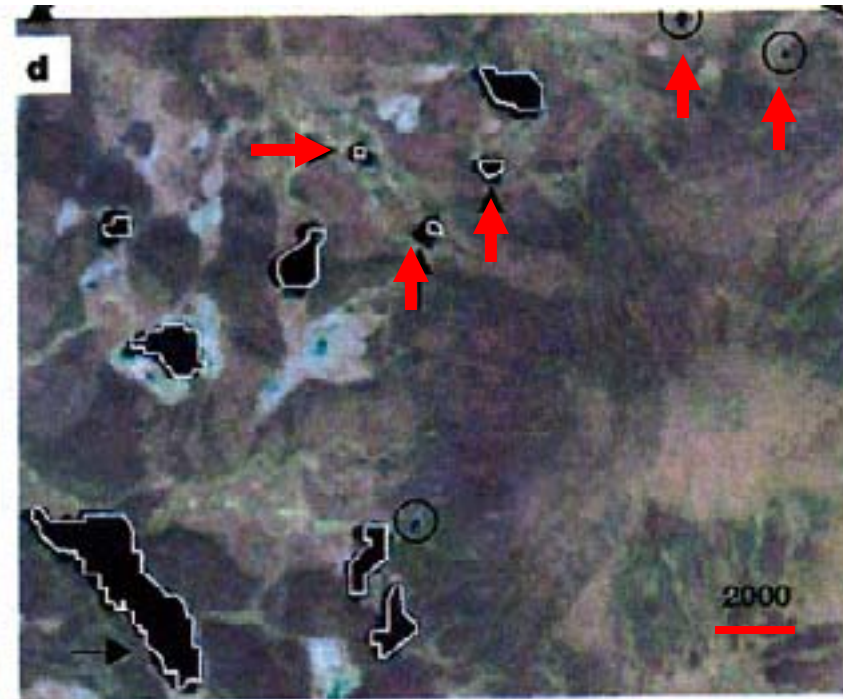
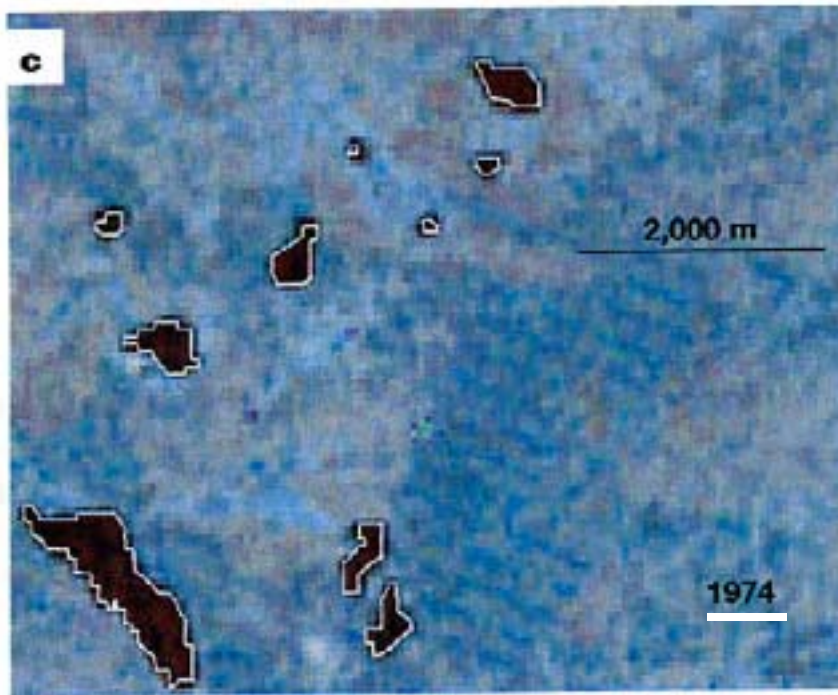
## LETTERS

**Methane bubbling from Siberian thaw lakes as a positive feedback to climate warming**K. M. Walter<sup>1</sup>, S. A. Zimov<sup>2</sup>, J. P. Chanton<sup>1</sup>, D. Verbyla<sup>3</sup> & F. S. Chapin III<sup>1</sup>

in the atmosphere. As the earth warms from CO<sub>2</sub> accumulation, CH<sub>4</sub> bubbling will increase correspondingly; permafrost melts, lakes get bigger, new ones are born. This feedback instability has yet to be incorporated in models of climate change. Main conclusions have been corroborated by a second team.

CH<sub>4</sub> is ~ 10x more effective per mole than CO<sub>2</sub> as a greenhouse gas.

Improvements in Landsat image analysis show that CH<sub>4</sub> bubbling from North Siberian lakes has accelerated from 1974 to 2000 and now accounts for 95% of new CH<sub>4</sub>





# Energy Working Group @ Penn

Inaugural Symposium

## The Search for a Sustainable Energy Future: Challenges for Basic Research

Friday March 9, 2007

Wu & Chen Auditorium, Levine Hall  
University of Pennsylvania

plenary speakers:



**Dr. George Crabtree**  
Senior Scientist and Director,  
Materials Science Division,  
Argonne National Laboratory  
*"The Global Energy Challenge"*



**Dr. JoAnn Milliken**  
Director, Department of  
Energy Hydrogen Program  
*"The Advanced Energy Initiative -  
Challenges, Progress, and Opportunities"*

lunch & poster session: Posters presenting ongoing research by Penn faculty, primarily in the areas of solar energy, hydrogen storage, fuel cells and structural materials.

sponsors: School of Engineering & Applied Science & The School of Arts & Sciences

Register On-line:

<http://www.energy.upenn.edu/registration.html>  
registration is free, but please register by Friday, March 2, 2007



- 9:00 am Poster set-up  
10:00 am Welcome  
10:15 am  
George Crabtree  
"The Global Energy Challenge"  
11:45 am Posters & Lunch  
1:45 pm  
JoAnn Milliken  
"The Advanced Energy Initiative -  
Challenges, Progress  
and Opportunities"  
3:15 pm Close

*Get involved!*

<http://www.energy.upenn.edu>

www.energy.upenn.edu

# THANKS TO .....

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Karen Winey (MSE)

Felice Macera, webmaster and a lot more

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Chris Jeffrey and Dave Pursell – publicity

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**GEORGE AND JOANN FOR PARTICIPATING!!**