

# Research News

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## SET Day explores the future of science

BY FRANK NOLAN  
Research Promotion

On February 16, Science, Engineering and Technology (SET) Day gave more than 200 students and teachers from 54 high schools across the province a rare glimpse into the future.

The first event of its kind to be held in Manitoba, SET Day featured presentations by leading researchers in six key fields: alternative energy, climate change, functional foods, nanotechnology, structural biology and astrobiology. The goal of the full-day event was to give the students and teachers an overview of current capabilities in each research area, and to speculate about how those capabilities might change in the next 25 years.

The event was sponsored by the Prairies Office of the Natural Sciences and Engineering Research Council of Canada (NSERC), the Association of Professional Engineers and Geoscientists of Manitoba (APEGM), the Office of the Vice-President (Research) at the University of Manitoba, and the Faculty of Education.

"We really wanted an event that would excite students about research in science and engineering, not only today's research, but the research we might be doing a couple of decades from now," said Digvir Jayas, associate vice-president (research) at the University of Manitoba. "High school students learn about the history of science, and about what we can do right now, but we wanted to take that a step further by focusing on the future."

After official greetings from Jayas and University of Manitoba president Emőke Szathmáry, SET Day kicked off with a presentation by plant scientist Anita Brûlé-Babel focused on alternative energy.

Titled *Wheat-Fueled Cars and Wind-Powered Cities*, the presentation detailed the advantages and disadvantages of various alternative sources of energy, including biomass conversion, hydroelectric power, wind, and solar power. Brûlé-Babel then focused on ethanol, describing her own research on creating new genetic strains of wheat specifically intended for ethanol production. She ended by outlining how future advances in her field, including sequencing the enormous wheat genome, could make ethanol an increasingly important energy source in the coming years.

Following Brûlé-Babel, David Barber, Canada Research Chair in Arctic system science, discussed his climate change research in a presentation titled *Walking on Thin Ice*. Barber, director of the Centre for Earth Observation Science (CEOS), described the impact global warming is having on Arctic sea ice, which is currently melting at a rate of 70,000 square kilometers each



Photo by Mya Kraft

**Kathleen Londry, microbiology, was one of six researchers who took part in Science, Engineering and Technology Day. Londry described the growing field of astrobiology.**

year, an area equal to the size of Lake Superior. Barber also highlighted the multidisciplinary nature of climate science, the challenges associated with conducting research in the Arctic, and the many research opportunities that will be available in the coming years.

The third SET Day presenter was Peter Jones, director of the Richardson Centre for Functional Foods and Nutraceuticals. In a presentation titled, *Putting the Best Food Forward*, Jones, Canada Research Chair in nutrition and functional foods, described the ways in which the human diet has gotten worse over the past 1,000 years. He also outlined the work scientists are doing to reverse this trend, including the development of nutrient-enriched foods, and nutraceuticals that contain concentrated forms of important dietary compounds. Jones also described how the field is expected to change over the next quarter-century as public interest in healthier foods continues to grow.

The afternoon session began with a presentation by Cyrus Shafai, electrical and computer engineering. *Big Changes from Little Things* showcased the wide range of futuristic products recently made possible by nanotechnology, including shirts that don't get wet, self-cleaning windows, and odour-resistant sports wear. Shafai also described the many advances nanotechnology is expected to bring in the coming decades, including new medical implants, tiny surgical instruments, and carbon nano-tube technology that could be used to build an elevator to space.

Following Shafai's presentation, Brian Mark, microbiology, focused the audience's attention down to

astrobiology in a presentation titled, *The Study of Life in the Universe*. Astrobiology is a growing field, and includes astronomers, biologists, chemists and geologists who are working to understand what makes a planet suitable for life, and whether or not such suitable conditions exist in places other than Earth. Londry described her own research on microbes that can survive in extreme conditions. Such organisms, she said, may offer clues about what life forms scientists might find elsewhere in our galaxy.

In keeping with the high-tech theme of the day, audience members were given remote devices that allowed them to answer questions posed by the researchers during their presentations. The audience responses were instantly displayed on a screen behind the presenter, making the event truly interactive.

After each presentation, participating students also took full advantage of question periods, and they gathered around presenters during scheduled breaks to learn more about their research.

In his closing remarks for SET Day, Education Dean John Wiens encouraged the students to share what they had learned with their classmates.

"It isn't every day that you get to hear some of the best scientific minds in the world describing the future of research in their fields," he said. "But that's exactly what you heard today."

The Office of the Vice-President (Research) is currently developing a SET Day Website, which will soon include audio recordings of all of the day's presentations. Check back soon at: [www.umanitoba.ca/research/set](http://www.umanitoba.ca/research/set)

the molecular level and the world of structural biology. *Life in Three Dimensions* described the cutting-edge tools—including stadium-sized synchrotrons—scientists use to study biological molecules. He likened a cell to a large and complex city, and described how structural biologists are working to determine the three-dimensional structure of all of the "cellular citizens" needed for the cell to carry out its function.

The final SET Day researcher was Kathleen Londry, microbiology, who described the futuristic field of



Photo by Mya Kraft

**Students gather around Cyrus Shafai (centre), electrical and computer engineering, following his presentation on nanotechnology.**

## Bringing Research To Life

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