

## **SUMMER SCHOOL on the MODELING OF ARCTIC CLIMATE**

Location: International Arctic Research Center  
University of Alaska  
Fairbanks, Alaska, USA

Dates: July 14-25, 2003

Coordinators: John Walsh, Vladimir Alexeev

Background: Arctic climate is the result of a complex interplay between the atmosphere, the ocean, sea ice and a terrestrial component in which freezing and thawing are critical to variations over a range of timescales. In view of the delicate balances between these components and their poorly documented sensitivities, it is not surprising that global climate models show the largest disagreement among themselves, and also the strongest greenhouse-induced changes, in the polar regions. Since changes in the Arctic may well have global implications, it is essential that Arctic climate simulations be enhanced in order to reduce the uncertainties in projections of climate change.

Scientific Program: The two-week summer school will bring together graduate students and young scientists, on the one hand, and specialists in Arctic climate and climate modeling, on the other hand, in order to convey to a new generation of scientists the opportunities and challenges of Arctic climate modeling. Specifically, young scientists will gain

- 1) perspectives on the key issues in Arctic climate from an observational, diagnostic and modeling perspectives,
- 2) exposure to the types of models used in addressing Arctic climate and climate change,
- 3) hands-on experience in the analysis of climate model output or in climate model experimentation at a level consistent with the students' expertise.

The summer school will consist of background pedagogical lectures in the mornings, and mini-projects and informal discussions in the afternoons. The mini-projects will be performed in collaboration with faculty members or lecturers, and will utilize existing databases and available models. Students will have access to personal computers and workstations for their mini-projects, on which they will give short presentations at the end of the two-week period.

Key topics to be covered in the lectures include, but are not limited to:

- Arctic climate: key characteristics and processes
- feedbacks in the Arctic system (e.g., surface albedo, clouds, water vapor, circulation)
- Arctic climate variations: past, ongoing and projected
- energy balance and single-column models applied to the Arctic
- global climate models: an overview
- modeling of the sea ice and the Arctic Ocean
- modeling of frozen soil regimes, especially permafrost
- Arctic ecosystems and climate change
- trace gases, aerosols and chemistry: importance for climate changes

Lecturers:

Visiting lecturers include

S. Manabe (Princeton University)  
V. Kattsov (Main Geophysical Observatory, St. Petersburg, Russia)  
R. Bates (Danish Center for Earth System Science)

C. Bitz (Polar Science Center, University of Washington)  
S. Vavrus (University of Wisconsin, Madison)

Lecturers from the University of Alaska include

Vladimir Alexeev  
Nicole Molders  
Uma Bhatt  
F. S. Chapin  
Igor Polyakov  
Vladimir Romanovsky

Support: IARC will provide support for travel (economy-class airfare), on-campus lodging and meals through its funding from the National Science Foundation.

IARC will also provide the facilities for the lectures, discussions and computer-based activities that comprise the program.

Application for participation and support: Graduate students and young scientists in relevant fields are encouraged to apply for participation in the summer school. Advanced undergraduate students with strong qualifications will also be considered. Applications should be sent as early as possible, but no later than March 15, to

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930 Koyukuk Drive  
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(Electronic submissions are encouraged)

Decisions about admission and financial support will be made by March 31, 2003 for applications received by March 15. Late applications will be considered at a later time depending on availability. Applicants should submit the following:

1. Statement of interest (1 page)
2. A short resume, including academic background
3. A letter of recommendation from a faculty member or supervisor