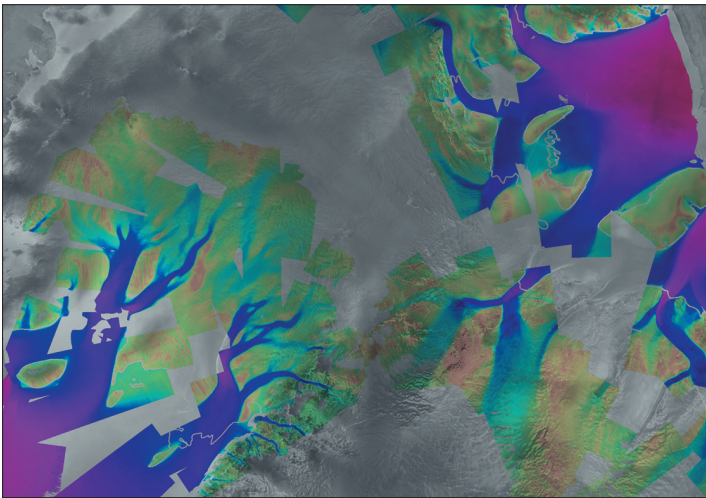


Scientific discussion meeting

## Evolution of the Antarctic ice sheet: new understanding and challenges

Monday 17 and Tuesday 18 October 2005



### Synopsis

Our ability to accurately predict future sea-level change is severely hampered by uncertainties associated with interactions between the Antarctic ice sheet and the global oceans and atmosphere. This Discussion Meeting will bring together scientists from a range of disciplines to determine how theoretical analysis, numerical modelling, satellite observations and field measurements can be best combined to constrain this uncertainty.

# Evolution of the Antarctic ice sheet: new understanding and challenges

Monday 17 October 2005

09.30 Registration and coffee  
Welcome and introductory  
remarks

## Session 1

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### Introduction and the observational record

Chair **Richard Alley**  
*Penn State University*

10.20 **Bob Bindschadler**  
*NASA*  
The environment and evolution of  
the West Antarctic ice sheet:  
setting the stage

10.50 **Discussion**

11.00 **David Sugden**  
*University of Edinburgh*  
The long-term perspective

11.30 **Discussion**

11.40 **Duncan Wingham and Andrew  
Shepherd**  
*University College London and  
University of Cambridge*  
The late 20th century Antarctic Ice  
Sheet: A challenge to modelling

12.10 **Discussion**

12.20 **Eric Rignot**  
*NASA*  
Satellite-based observations of  
coastal changes in ice sheet  
dynamics

12.50 **Discussion**

13.00 **Lunch**

## Session 2

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### Evidence for external forcing

Chair **Duncan Wingham**  
*University College London*

14.00 **David Vaughan**  
*British Antarctic Survey*  
Evidence for recent climate  
change in Antarctica

14.30 **Discussion**

14.40 **Stan Jacobs**  
*Lamont-Doherty Earth Observatory*  
Observations of change in the  
Southern Ocean

15.10 **Discussion**

15.20 **David Holland**  
*Courant Institute*  
Numerical modelling of ice shelf -  
ocean interaction in the  
Amundsen Sea, Antarctica

15.50 **Discussion**

16.00 **Tea**

16.30 **David Bromwich**  
*Byrd Polar Research Centre*  
Recent variability and trends in  
Antarctic snow accumulation from  
Polar MM5 simulations

17.00 **Discussion**

17.10 **General Discussion**

17.30 **Poster session**

18.30 **Close**

Tuesday 18 October 2005

## Session 3

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### Modelling ice sheet response and internal variability

**Chair Tony Payne**

*University of Bristol*

**09.00 Philippe Huybrechts**

*Free University of Brussels*

Ice sheet and sea level change from coupled climate modelling

**09.30 Discussion**

**09.40 Richard Hindmarsh**

*British Antarctic Survey*

The role of longitudinal stresses in determining the stability and sensitivity of the Antarctic ice sheets: back-pressure, grounding line motion and thermal feedbacks

**10.10 Discussion**

**10.20 Andrew Fowler**

*University of Oxford*

Subglacial floods beneath ice sheets

**10.50 Discussion**

**11.00 Coffee**

## Session 4

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### Data assimilation

**Chair Richard Hindmarsh**

*British Antarctic Survey*

**11.30 Ian Joughin**

*University of Washington, Seattle*

Integrating satellite observations with modelling

**12.00 Discussion**

**12.10 Andreas Vieli and Tony Payne**

*University of Bristol*

Changing Antarctic ice shelves, insights from numerical modelling constrained by observations

**12.40 Discussion**

**12.50 Rob Arthern**

*British Antarctic Survey*

Determining Antarctica's contribution to sea level rise using data assimilation methods

**13.20 Discussion**

**13.30 Lunch**

## Session 5

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### Global and long term consequences and connections

**Chair Julian Hunt**

*University College London*

**14.30 Jonathan Gregory**

*University of Reading, Hadley*

*Centre*

and

**Richard Alley**

*Penn State University*

Land ice contributions to future sea level change

**15.00 Discussion**

**15.10 Panel Discussion**

**Chair Julian Hunt**

*University College London*

**16.30 Close**

## Notes

- Only the names of those presenting papers are listed within. Full authorship will appear in the published report.
- The proceedings of the meeting are scheduled to be published in late summer 2006 in *Philosophical Transactions of the Royal Society* series B.
- It is regretted that neither photography nor recording is permitted in the lecture hall during the meeting.
- Cheques for lunch should be made payable to The Royal Society. No lunch tickets will be issued unless this form is accompanied by the necessary remittance in sterling. Payment from abroad must be by bankers' draft in sterling drawn on UK clearing bank. Lunch is a hot fork standing buffet.
- Please note confirmation of registration will not be emailed until approximately a month prior to the meeting.

## Booking

All interested in the subject are welcome at the meeting. Those wishing to attend should complete the form overleaf and return it as soon as possible to the address below. Registrations will close if the capacity in the lecture theatre is exceeded.

Sarah Emberson  
Science Communication Section  
The Royal Society  
6–9 Carlton House Terrace  
London SW1Y 5AG

For further information please email your mailing details to:

[discussion.meetings@royalsoc.ac.uk](mailto:discussion.meetings@royalsoc.ac.uk)

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### **Front cover image:**

*Satellite image of the flow of the West Antarctic ice sheet. The image shows the surface horizontal velocity of the West Antarctic ice sheet as measured using interferometry with synthetic-aperture radar data. Colours refer to velocity in the range 0 to 3000 m/yr, while the underlying greyscale image shows the synthetic-aperture radar intensity data. Data processed by Dr. Ian Joughin at NASA's Jet Propulsion Laboratory.*

### **Organised by**

Lord Julian Hunt CBE FRS,  
Dr Anthony Payne and  
Professor Peter Sammonds

# Evolution of the Antarctic ice sheet: new understanding and challenges

**Monday 17 and Tuesday 18 October 2005**

1 I shall attend the meeting on:  17 October  18 October  
(free admission)

2 I wish to book lunch on:  17 October  18 October  
(lunch costs £14.50 per day including VAT—see note overleaf)

I enclose a lunch cheque for £ \_\_\_\_\_ or debit this amount from my:

Access  Mastercard  Visa

Card no.

Expiry date: \_\_\_\_\_ Signature: \_\_\_\_\_

Please complete clearly in capital letters

Name: (Prof/Dr/Mr/Mrs/Ms/Miss) \_\_\_\_\_

Occupation/Job function: \_\_\_\_\_

Organisation: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Tel: \_\_\_\_\_ Fax: \_\_\_\_\_

Date: \_\_\_\_\_ Email: \_\_\_\_\_

Where did you hear about this meeting? \_\_\_\_\_

\_\_\_\_\_

Form continues overleaf...

# Evolution of the Antarctic ice sheet: new understanding and challenges

Monday 17 and Tuesday 18 October 2005

**Please note this section is optional.**

Please help the Royal Society's commitment towards an **Equal Opportunities Policy** by completing this form. The information provided will form a confidential statistical record/database in accordance with the Data Protection Act and will not be used for any purpose other than analysis of the Society's events and activities.

**Age**     29 or under     30–39     40–49     50–59     60 or over

**Are you?**     Male     Female    **Are you registered disabled?**     Yes     No

**Occupation**     Professional     Student

Retired     Unemployed

Other: please specify \_\_\_\_\_

**Are you ordinarily resident in the UK?**     Yes     No    If No, which country do you normally reside in? \_\_\_\_\_

**Ethnic origin**    *This section uses codes based on those used in the Government's Census of Population*

**White**     British     Irish     Other White

**Mixed**     White & Black African     White & Asian  
 White & Black Caribbean     Other Mixed

**Asian/Asian British**     Indian     Pakistani     Bangladeshi     Other Asian

**Black/Black British**     Caribbean     African     Other Black

**Chinese**         **Other ethnic group**    Please give details

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# Forthcoming discussion meetings organised by the Royal Society

Monday 14 and Tuesday 15 November 2005

## **Quantum catalysis in enzymes - beyond the transition state theory paradigm**

*Professor Nigel Scrutton, Professor Les Dutton FRS, Dr Andrew Munro and Dr Mike Sutcliffe*

Monday 5 and Tuesday 6 December 2005

## **New directions in liquid crystal science**

*Professor Duncan Bruce, Professor JW Goodby, Professor JR Sambles FRS and Professor HJ Coles*

Monday 16 and Tuesday 17 January 2006

## **Physics, chemistry and astronomy of H3+**

*Professor Takeshi Oka FRS, Jonathan Tennyson and Dieter Gerlich*

Monday 13 and Tuesday 14 February 2006

## **Conditions for the emergence of life on the early Earth**

*Dr Sydney Leach FRS, Professor Ian Smith FRS and Professor Charles Cockell*

Monday 6 and Tuesday 7 March 2006

## **Species and speciation in micro-organisms**

*Professor Brian Spratt FRS, Professor James Stanley and Dr Matthew Fisher*

Monday 3 and Tuesday 4 April 2006

## **Origin and differentiation of the Earth: past to present**

*Professor Andrew Jephcoat and Professor AN Halliday*

Monday 22 and Tuesday 23 May

## **Social intelligence: from brain to culture**

*Professor Chris Frith FRS, Dr Nathan Emery, Dr Nicky Clayton*

Monday 5 and Tuesday 6 June 2006

## **Supramolecular nanotechnology for organic electronics**

*Dr Franco Cacialli, Professor HL Anderson and Professor Sir Richard Friend FRS*

Monday 25 and Tuesday 26 September 2006

## **Recent developments in the study of Gamma-ray bursts**

*Professor Sir Martin Rees FRS, Professor KO Mason and Professor A Wells*

Monday 16 and Tuesday 17 October 2006

## **Mental processes in the human brain**

*Professor Jon Driver, Professor Patrick Haggard and Professor Tim Shallice FRS*

These events are free to attend, however, pre-registration is required for scientific discussion meetings. For more information on all Royal Society events please visit our website at [www.royalsoc.ac.uk/events](http://www.royalsoc.ac.uk/events)

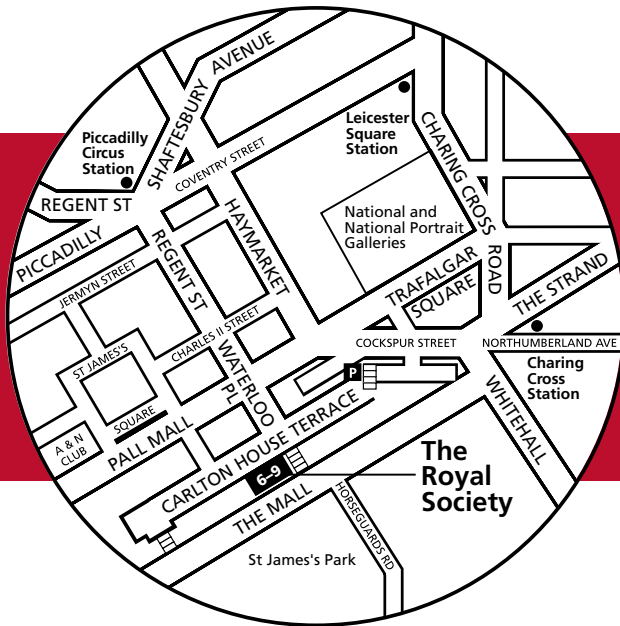
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