



## EXPRESSION OF INTENT FOR ACTIVITIES IN IPY 2007-2008.

**Deadline for Submission - January 14, 2005**

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### 1.0 PROPOSAL INFORMATION

#### 1.1 Title of proposed activity

International Partnerships in Ice Core Science-International Polar Year Initiative

#### 1.2 Acronym or short form title of proposed activity

IPICS-IPY

#### 1.3 Concise outline of proposed activity

Ice cores have contributed substantially to understanding climate change. They provide convincing evidence of large, abrupt climate changes, and demonstrate the tight link between greenhouse gases and climate. However, there is a great deal more to learn. In 2004, representatives of all major ice coring nations agreed on a common agenda for the next decade. This agenda looks beyond established projects and includes coring over all available timescales, with highest feasible resolution. IPY provides an opportunity to launch this initiative. Other ice coring efforts, including some that are part of IPICS, are the subject of separate IPY submissions, as indicated below.

IPICS related events planned for IPY include:

**1. Searching for oldest possible ice core.** Before 800-900 kyr, earth's climate had a 40 kyr glacial-interglacial period, rather than the current 100 kyr. IPICS aims to find a 1.2 Myr record and help discover why the frequency changed. During IPY, initial survey work will occur as part of the IDEA ice divides traverses (separate proposal), by French/Italian/Russian teams in the Dome C-Vostok-Dome B region, and by US-led radar and remote sensing teams. IPICS will collate results to recommend drilling sites.

**2. Initiation of coring to recover the last interglacial and older ice from Greenland.** The last interglacial was probably warmer than the present and is an analogue for an anthropogenically-warmed world. We need to learn about the behaviour of climate and the Greenland ice sheet during this time. The oldest reliable core only partly penetrates the last interglacial. Drilling in NW Greenland would start, and possibly finish, in IPY. Danish, US, French, and German groups have expressed interest, and others are expected to join.

**3. Starting a detailed spatial network of deep and intermediate-depth Antarctic ice cores.** The spatial pattern of change is key to climate dynamics. We have cores

from central East Antarctica and from a few coastal regions, but additional data are needed from other key areas, including the northern part of Lake Vostok, coastal Antarctica, the Antarctic peninsula, and West Antarctica. High-resolution data that allow precise comparison of Antarctic climate variability and changes in greenhouse gases are particularly critical. The WAIS Divide Program (U.S. program with international collaboration) and European drilling at Talos Dome in east Antarctica will take place during IPY. These are the initial stages of the larger effort to fully sample Antarctic spatial climate variability on all possible time scales.

**4. Late Holocene climate change in high resolution in both polar regions.** Future change can only be assessed in the context of natural climate variability. Highly resolved compilations of past global climate (timescale up to 2000 years) critically lack polar data. The SCAR project, ITASE, produced about 250 cores that primarily cover the last 250 years. Extending this time scale to the last millennium, and expanding the scope in the Arctic, are critical. IPY will engage all countries to complete work in Antarctica and continue the effort in the Arctic.

1.4 Which IPY 2007-2008 theme(s) will be addressed by the project (see Note 1)

<b>Theme 1 – The current state of the polar environment</b>	Y
<b>Theme 2 - Change in the polar regions</b>	Y
<b>Theme 3 - Polar-global linkages and interaction</b>	Y
<b>Theme 4 - Investigating new frontiers</b>	Y
<b>Theme 5 -The polar regions as vantage points</b>	Y
<b>Theme 6 - Human societies in polar regions</b>	N

1.5 What is the major target of the proposed activity (specify one – see Note 1)

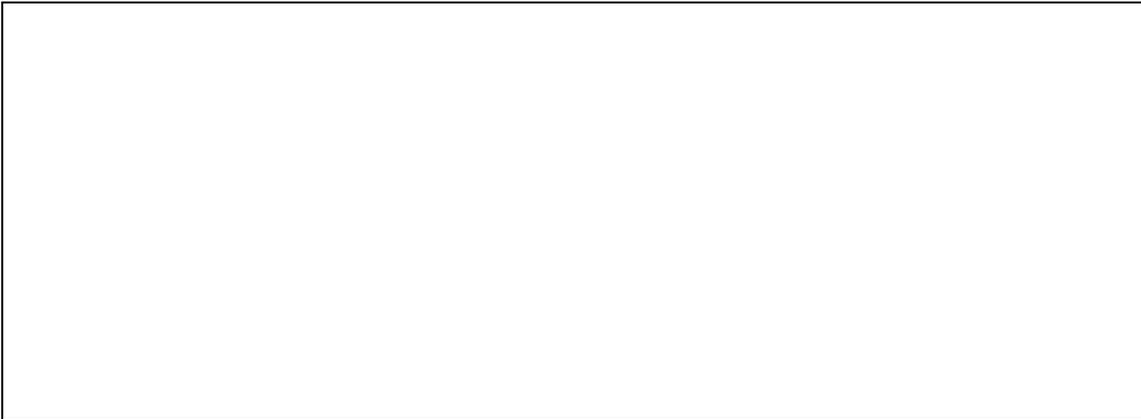
<b>Natural or social science research</b>	Y
<b>Education/Outreach and Communication</b>	N
<b>Data Management</b>	N
<b>Legacy</b>	N
<b>Other Targets</b>	N

1.6 What significant advance(s) in relation to the IPY themes and targets can be anticipated from this project?

IPICS will enhance understanding of both polar regions by generating data relevant to a multitude of climate and environmental change problems. IPICS is most relevant to IPY Themes 1-5.

During IPY, we will take the first steps in this decade-long effort, by:

- Identifying sites for a > 1 Ma ice core.
- Drilling through the last interglacial in Greenland.
- Obtaining a high resolution 100,000 year Antarctic climate record (WAIS Divide)
- Establishing the framework for a network of ice cores to examine climate variability on thousand year time scales.
- Building international teams of existing and new researchers.



1.7 What international collaboration is involved in this project? (see Note 2)

IPICS developed from an international meeting (Washington, April 2004). It builds on existing successful multinational projects such as GRIP, EPICA, Vostok, NGRIP, and ITASE. The IPICS science plan will guide sub-groups about locations of survey and drilling activities. IPICS has a small steering committee, and has established two international writing groups. The initial IPICS meeting included scientists from Great Britain, Denmark, France, Russia, United States, Germany, Japan, China, Switzerland, Italy, and Australia.

## **2.0 FIELD ACTIVITY DETAILS**

2.1 Outline the geographical location(s) for the proposed field work (see Note 3)

Central East Antarctica (survey for deep core), NW Greenland (deep core), West Antarctica (deep core), coastal Antarctica, Greenland and Arctic islands (intermediate cores), entire polar regions (shallow cores).

## 2.2 Define the approximate timeframe(s) for proposed field activities?

Arctic Fieldwork time frame(s)	Antarctic Fieldwork time frame(s)
05/07 – 09/07	11/07 – 03/08
05/08 – 09/08	11/08 – 03/09
Ongoing for following decade	Ongoing for following decade

2.3 What significant logistic support/facilities will be required for this project?  
Can these resources be usefully shared with other projects? (see Note 4)

Aircraft for airborne survey and traverses, and drill camps (LC130 and other).

Ice core drill(s) and drilling crews.

Drilling camps potentially can offer support for other activities on the ice sheets.

No large advances in technology are envisioned, apart from advances in ice drilling and analytical tools.

## 2.4 Will the project leave a legacy of infrastructure? (see Note 1)

1. Location for the oldest possible Antarctic ice core.
2. Drilling camp and possibly core through the full interglacial in Greenland.
3. The backbone of a major network of cores.
4. A “toolkit” of ice drilling technology.
5. The next generation of ice core scientists.

## 2.5 How is it envisaged that the required logistics will be secured? (one or more options can be identified)

Consortium of national polar operators	Y
Own national polar operator	Y or N
Another national polar operator	Y or N
National agency	Y or N
Military support	Y or N
Commercial operator	Y or N
Own support	Y or N
Other sources of support	Y or N
It is anticipated that the Antarctic survey will be carried out by one or more national operators; the Greenland drilling by one or more national operators, and components of the remaining network by a coordinated consortium of individual operators at each site or group of sites. Analysis of cores and data for the Antarctic and Greenland projects will likely involve additional international partners within IPICS.	

## 2.6 Has the project been "endorsed" at national or international level (see Note 5)

Y	The project was agreed as a consensus plan at the IPICS meeting in April 2004. The U.S. Ice Core Working Group has also endorsed the IPICS plan. The PAGES International Project Office has expressed enthusiasm for the proposed efforts and welcomes opportunities to facilitate international links to IPICS activities.
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### 3.0 PROJECT MANAGEMENT AND STRUCTURE

3.1 Is the project a component (established over the IPY 2007-2008 timeframe) of an existing plan, programme or initiative or is it a new autonomous proposal?

New Project	Y	Component of an existing or planned activity	Y
<p>IPICS has emerged as the next step after the success of projects such as GRIP/GISP2, EPICA, Vostok, ITASE, and Dome Fuji. IPY gives a focus for starting IPICS. Some of the components have been discussed at national levels previously, and some are in initial stages of implementation, but the internationalization of the efforts described here is new.</p>			

3.2 How will the project be organised and managed? (see Note 6)

Organisation will be discussed fully at a meeting to be arranged by ESF in 2005, and at subsequent meetings. The existing steering committee (set up initially to organise the first meeting) will be expanded. Its role will be to define the target drill sites, collate the outcomes, and maintain overall IPICS structure and momentum. Individual activities will be organised and run by separate national and international consortia – a method that has worked well in successive previous projects.

3.3 What are the initial plans of the project for addressing the education, outreach and communication issues outlined in the Framework document? (see Note 7)

- 1) IPICS steering committee will coordinate outreach.
- 2) Individual projects will develop outreach with organizations that specialize in these efforts.
- 3) Print, television and other media will visit IPICS field and laboratory sites.
- 4) Individual investigators will conduct local outreach.
- 5) IPICS projects will recruit graduate students, postdocs, and junior researchers.

3.4 What are the initial plans of the project to address data management issues (as outlined in the Framework document)? (see Note 8)

Major ice coring projects have traditionally deposited their datasets at WDC for Paleoclimate in Boulder, USA, Pangaea, and/or NSIDC in Boulder. This will continue for the IPICS elements. The IPICS steering committee will take an active role in creating effective data management structures.

3.5 How is it proposed to fund the project? (see Note 9)

As with previous ice core drillings, funds will be obtained for each sub-component from national operators, as well as from international funding sources such as the EU. Coordination of funding and project logistics between nations will be required.

### 3.6 Is there additional information you wish to provide?

Individual sub-components of IPICS that are fairly well developed in terms of planning may choose to submit separate, more detailed proposals that also contribute to this overall umbrella. At this writing, the Greenland Deep Drilling project (Dorthe Dahl-Jensen, University of Copenhagen, lead contact), the WAIS Divide Ice Core (Ken Taylor, Desert Research Institute, lead contact), the North Vostok Drilling Project, and the IDEA traverses are subjects of draft IPY submissions.

## 4.0 PROPOSER DETAILS

### 4.1 Lead Contact for the Expression of Intent

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### 4.2 List up to six other project members and their affiliation.

Name 1 Dr. Jeff Severinghaus

Organisation Scripps Institute of Oceanography, San Diego, California

Name 2 Dr. Vladimir Y. Lipenkov

Organisation Arctic and Antarctic Research Institute, St. Petersburg, Russia

Name 3 Dr. Dominique Raynaud

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Grenoble, France  
Name 4 Dr. Yoshiyuki Fujii  
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Name 5 Dr. Dorthe Dahl-Jensen  
Organisation University of Copenhagen, Copenhagen, Denmark  
Name 6 Dr. Heinz Muller  
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## Accompanying Notes for submission of IPY 2007-2008 Expressions of Intent

**Note 1** – IPY projects can take a number of forms.

a) 1.4 - They may address one or more of the IPY 2007-2008 themes and if so will be expected to have component activities addressing education, outreach, data management and possibly legacy.

b) 1.5 - The main focus can be on science or on one or more aspects of education, outreach and communicating the Polar Year, an activity that addresses data management or that explicitly leaves a legacy (such as building a new polar facility or establishing new systems).

**Note 2** - An important characteristic of IPY 2007-2008 projects will be their international structure in order to facilitate research impractical for a single nation to undertake. Whilst project components are likely to be primarily funded at a national level, the projects are expected to be established and coordinated internationally. The Joint Committee will be looking for evidence of international collaborations developing in the Expressions of Intent and established by the June 2005 full proposal deadline.

**Note 3** – The geographic locations need not be precise but logistic operators will want to broadly know where activities will occur, e.g. West Antarctic Ice Sheet, Weddell Sea, Svalbard, Greenland, etc. If you have more detail please supply. An IPY project can also be one that involves no field activities.

**Note 4** - This refers to major facilities and infrastructure and some examples (not comprehensive) are given below.

Ice-breaker	Multi-instrumented platforms	Snow terrain vehicles
Ice strengthened research ship	Helicopters	Existing field stations
Ship-based drilling capability	Fixed wing geophysical aircraft	New field station
Ship recovery of buoys etc	Fixed wing transport aircraft	Observatories
Submarines	Rockets	Fuel depots
Autonomous Underwater Vehicle	Satellites	Ice drilling capability
Remotely Operated Vehicle	Radars	Rock-drilling capability

Please note if your project will share facilities with other IPY activities, or if there is capacity to support other projects as part of your activity (e.g. a marine biodiversity cruise could feasibly offer to deploy or recover buoys, moorings, etc., for an ocean/climate project)

**Note 5** - All IPY projects will ultimately be subject to assessment by National (and/or International) funding agencies. However it will be important to establish coordination of IPY 2007-2008 at the national and international level. Both National IPY Committees and International bodies supporting IPY 2007-2008 will have an important role in this. Contact with these bodies may occur before January 14 2005 but should certainly take place before the June 2005 deadline for full proposals.

**Note 6** – The Joint Committee for IPY 2007-2008 will be overseeing Polar Year activities but will not be managing the individual projects. It is anticipated that IPY projects will be self-managed, free-standing activities or be part of a planned or existing programme that has an established management structure. The JC will need to be satisfied that all proposals have realistic plans for structuring and managing activities. For the larger proposals the JC anticipates that a Project Steering Committee will be established.

**Note 7** – It will be a requirement of IPY proposals that there is a clear plan for Education, Outreach and Communication (EOC) activities in the full proposal for the June 2005 deadline. If initial ideas for EOC have been established these can be outlined in the Expression of Intent.

**Note 8** – It will be a requirement of IPY proposals that there is a clear plan for the management of project data, including its early availability to the community, presented in the full proposal for the June 2005 deadline. Initial ideas for data management should be outlined in the Expression of Intent, including which data organisations are likely to be involved, e.g. ICSU World Data Centres, Joint Committee for Antarctic Data Management, WCRP, etc.

**Note 9** – It is anticipated that funding for IPY 2007-2008 will be primarily obtained through national funding agencies but in some cases will involve international funding agencies (e.g. European Union) and in some cases will come from private sources. Certain projects will be part of programmes already funded and if so these can be identified here.