

**COLLABORATION AGREEMENT  
BETWEEN  
CENTRO DE ESTUDIOS CIENTIFICOS, VALDIVIA,  
CHILE  
AND  
NIELS BOHR INSTITUTE, COPENHAGEN, DENMARK  
ON  
GLACIOLOGY AND CLIMATE CHANGE**

**Introduction**

The Glaciology Group, Niels Bohr Institute for Astronomy, Physics and Geophysics (NBIfAFG), University of Copenhagen, Denmark and the Laboratory for Glaciology and Climate Change, Centro de Estudios Científicos (CECS), Valdivia, Chile, signed on July 11th, 2001 in Copenhagen a Memorandum of Understanding

**Past Activities**

As part of the MoU the following activities have already been carried out by both parties:

- Sep.-Oct. 2001: participation of Soren Nielsen from NBIfAFG in a field campaign to Southern Patagonia Icefield
- Nov. 2001: airborne survey of glaciers in Patagonia, organised by Niels Gundestrup, with participation of Kristian Keller, KMS, with an ice radar and laser altimeter systems.
- December 2001: publication of the book "The Patagonian Icefields", Proceedings of the March 2000 Expedition to Patagonia, including a contribution by Niels Gundestrup, who participated in the expedition.
- July 2002: visit by Gino Casassa and Andrés Rivera of CECS to Copenhagen for firn core processing in collaboration with Anders Svensson.
- July 2003: participation of Rodrigo Zamora to North Grip Expedition, Greenland. Work on ice core retrieval and preliminary analysis, and ice radar.

## **AGREEMENT ON FUTURE ACTIVITIES**

Based on the MoU, and joint development plans, both parties now agree on the following activity plan for the period 2004-2006. Each party is expected to cover travel and living costs of their own personnel. Funds for research will be sought through normal funding mechanisms of each institution, government agencies of both countries and by means of presentation of joint proposals to international funding agencies.

### **A) Exchange of Scientists and students**

- Two scientists of NBIfAFG are invited to participate every year to a campaign to Patagonia and/or Antarctica, in ice core research and/or glacier geophysics.
- Two scientists of CECS are invited every year to participate in a campaign to Greenland, in ice core research and/or glacier geophysics.
- One scientist at the postdoctoral fellow level is invited to Valdivia during the period 2004-2006.
- Two senior scientists are invited to Valdivia for 1 month every year as adjunct researchers to CECS.
- One scientist from CECS is invited for 1 month every year to work at NBIfAFG.
- One student from CECS is invited to NBIfAFG to pursue a M.Sc. or Ph.D. in Geophysics within the period.

### **B) Scientific Research**

Glaciological research will concentrate on the following topics:

- Ice core research: one area of particular interest to CECS is to start an ice core facility in Valdivia during 2004
- Glacier geophysics
- Ice flow modelling
- Cryospheric change from airborne and satellite surveys (e.g. Cryosat, Icesat and GRACE platforms)
- Calibration/validation of satellite sensors in test sites in Patagonia and Antarctica
- Application of airborne methods for geoidal and gravity studies

### **C) International Glaciology Course**

CECS and NBIfAFG will organise an International Summer Glaciology Course at CECS, Valdivia, addressed to graduate and postgraduate

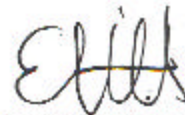


students, unique in Latin America. Several senior scientists from NBIfAFG are expected to participate.

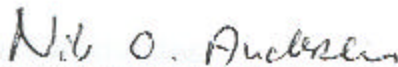
This agreement is signed by Mr. Eric Goles, President of the National Commission of Scientific and Technical Research (CONYCIT), representing the Chilean Institutions mentioned hereby and by the Rector of the University of Copenhagen, Profesor Linda Nielsen, on behalf of the authorities hereby mentioned of the Niels Bohr Institute.



**Rector of the University of  
Copenhagen  
Profesor Linda Nielsen**



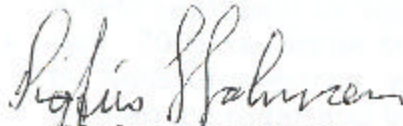
**President of  
CONYCIT  
Mr. Eric Goles**



**Nils O. Andersen  
Director  
Niels Bohr Institute, University of  
Copenhagen**



**Claudio Teitelboim  
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Centro de Estudios Científicos,  
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**Sigfus J. Johnsen  
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**Gino Casassa  
Director  
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Valdivia**

Copenhagen, 26 January, 2004