

Frontiers and Opportunities in Antarctic Geosciences

Certosa di Pontignano (Siena) – 28 – 31 August 2004

General program

Saturday, 28 August

20 00 – 21 30 Registration and Icebreaker Portico at Pontignano

Sunday, 29 August

09 30 – 12 45 Opportunities in Antarctica and offshore: Overview of National and International Research Activities

14 15 – 15 25 Keynote presentation session

15 45 – 17 45 FORUM: Keeping Geology & Geophysics strong in future Antarctic research

15 45 Panel discussion

16 45 Group discussion

17 45 – 19 30 Poster session & Social hour

Monday, 30 August

08 30 – 10 20 Investigation of Antarctic lithosphere: Petrology and isotope geochemistry

10 20 – 11 10 Poster session & social hour

11 10 – 13 10 Frontiers in glacial geology: Paleoenvironments

14 30 – 19 30 EXCURSION to Siena

20 30 Workshop dinner

Tuesday, 31 August

09 00 – 11 30 Structural and geophysical investigations of Antarctic lithosphere I:
West Antarctica and West Antarctic rift system

11 30 – 12 30 Structural and geophysical investigations of Antarctic lithosphere II:
The Antarctica margin / Gondwana margin configuration

14 00 – 15 00 Wrap up session – Implementing workshop strategies in future

Notes: All posters will be on display throughout the workshop.

Customary mealtimes (if not indicated differently): Breakfast 0800; Lunch 1300; Dinner 20 00

Presentation Timetable

Sunday, 29 August 2004

09 30 Welcome from Co-Conveners -- Introduction to "Forum" themes and objectives

National/International Research Activities & Opportunities in Antarctica and offshore: Overview

09 45 **J. Thiede**, President of SCAR – SCAR and the International Polar Year

10 00 **T.J. Wilson** – U.S. Geology and Geophysics community planning for Antarctic research

10 15 **A. Capra**, Chair of the Geosciences Scientific Group of SCAR –
Geoscience activities and a Geodetic Reference Frame for Antarctica

10 30 **J.A Crame** – Geosciences research in the British Antarctic Survey, 2005-2010

10 50 **M. Studinger** – Planning for an airborne platform for Antarctic Geology and Geophysics

11 10 **Coffee break**

11 30 **C. Siddoway & F. Davey** –
Introduction to forum topic: Keeping Antarctic Geology & Geophysics **strong** in future research

11 45 **R. Trouw** – Brazilian participation in Antarctic Geosciences research and international collaborations
in the Scotia Sea

12 05 **S. Ceramicola** – PATHWAYS: Palaeoceanographic Pathways in the North Atlantic-Arctic Ocean

12 25 **D. Praeg** – GLacialMeltwater and the Sedimentary Architecture of High-Latitude Continental Margins
(GLAMAR)

12 45 **Pranzo -- Lunch**

Keynote presentation session

14 15 **D. Harwood** – ANDRILL Program stratigraphic drilling project in southern McMurdo Sound (SMS):
An overview of site surveys and scientific objectives

14 45 **R. Law** – Determining strain histories and vorticity of flow in high grade rocks: The example of pure
shear deformation and extrusion of high grade rocks in the Greater Himalayan Slab

15 25 **Coffee break**

15 45 **FORUM: Keeping Geology & Geophysics strong** in future Antarctic research
Moderator: Fred Davey

15 45 **Panel discussion**

Panel: Alan Vaughan, British Antarctic Survey, UK
Peter Barrett, Victoria University of Wellington, NZ
Carlo Alberto Ricci, Università di Siena and Museo Nazionale dell'Antartide, I
Martin Siegert, Bristol Glaciology Centre, University of Bristol, UK
Sridhar Anandkrishnan, Pennsylvania State University, USA
Ian Dalziel, Institute for Geophysics, University of Texas-Austin, USA
Norbert Roland, Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, G

16 45 **Group discussion**

17 45 **Poster session I** (note that all the posters will be on display during the whole workshop) **& social hour**

20 00 **Cena -- Dinner**

Investigation of Antarctic lithosphere: Petrology and isotope geochemistry

- 08 30 KEYNOTE: **Kathy Licht** – Petrographic and isotopic composition of Ross Embayment till
- 09 00 **G. Di Vincenzo** – Dating brittle faulting: exploiting the complementarity of the step-heating and in situ ^{40}Ar - ^{39}Ar laser techniques to disentangle the complexity of Cenozoic fault-generated pseudotachylytes from the West Antarctic Rift System
- 09 20 **M. Flowerdew** – Hf isotopes and detrital zircon studies from the Gondwana margin of Antarctica
- 09 40 **S. Mukasa** – A case for drilling the Dufek layered Mafic Intrusion, Antarctica Based on Available Nd, Sr and Pb Isotopic and Trace Element Data
- 10 00 **D. Perugini** – Vegetation Island mafic-felsic associations (Terra Nova Intrusive Complex, Antarctica): an example of replenishment of a felsic magma chamber by continuous influx of mafic magma revealed by field evidence and fluid-mechanics experiments
- 10 20 **Poster session II** (note that all the posters will be on display during the whole workshop) & **Coffee break**

Frontiers in glacial geology: Palaeoenvironments

- 11 10 **R. Scherer** – A new approach to integrated studies of ice sheet grounding line processes
- 11 30 **F. Fasano** – 3-D petrography of cores of rocks and glacial sediments through an innovative tomographic system for paleoclimatic investigations
- 11 50 **L. Schoenbohm** – An erosion history from depth-dependent of cosmogenic ^{10}Be , ^{26}Al , ^3He and ^{21}Ne data in sandstone bedrock, Dry Valleys, Antarctica
- 12 10 **F. Donda** – The Wilkes Land continental margin: a record of the East Antarctic Ice Sheet evolution through the Cenozoic
- 12 30 **A. Caburlotto** – Quaternary climatic changes recorded by processes on the Wilkes Land Continental Margin
- 12 50 **I.E. Tabacco** – Detection and characterization of subglacial lakes in Vincennes and Aurora Basins (East Antarctica)
- 13 10 **Pranzo LUNCH**

Afternoon

- 14 00 – 19 30 **EXCURSION** - Walking tour: introduction to the geological setting of the hilltop city of Siena, with exploration of the ancient aqueduct and historic water delivery systems. Field trip leaders: A. Costantini, University of Siena, and V. Pascucci, Sassari University. The trip will begin at Porta San Marco and conclude at the Enoteca Nazionale d'Italia (located in the 16th century fortress, "Fortezza Medicea" of Siena), where we will enjoy a glass of wine together.
- 20 30 **Workshop dinner** to be served in the outdoor Portico at Pontignano

Tuesday, 31 August

Structural and geophysical investigations of Antarctic lithosphere I: West Antarctica and the West Antarctic rift system

- 09 00** KEYNOTE: **Carmen Gaina** – Evolution of circum-Antarctic oceanic crust since the Cretaceous
- 09 30** **I. Dalziel** – Tracing the West Antarctic Rift System
- 09 50** **S. Rocchi** – Tight link between Cenozoic magmatism and local-regional fault activity in the West Antarctic Rift
- 10 10** **E. Armadillo** – Recent aeromagnetic and deep electromagnetic surveys in northern Victoria Land
- 10 30** **Coffee break**
- 10 50** **A. Vaughan** – Multi-phase history of the mid-Cretaceous Palmer Land event in the southern Antarctic Peninsula: implications for terrane boundaries and kinematic evolution

Structural and geophysical investigations of Antarctic lithosphere II: The Antarctica margin / Gondwana margin configuration

- 11 10** **L. Lawver** – Onshore-offshore East Antarctica
- 11 30** **C. Ribecai** – On the age of the Beacon Supergroup at the Section Peak locality (North Victoria Land, Antarctica): a review.
- 11 50** **V. Korepanov** – Study of crustal structure of the region near Ukrainian Antarctic station by electromagnetic methods
- 12 10** **F. Ferraccioli** – Recent airborne geophysics exploration projects of the British Antarctic Survey
- 12 30** **Pranzo -- Lunch**
- 14 00** **Wrap-up session**
Participant input on workshop report and proceedings / submission and editorial process
- 15 00** **Conclusion of workshop**

POSTER PRESENTATIONS

Poster Session I: Investigation of Antarctic Lithosphere

Sunday 17 45 – 19 45

- F. Accaino** - Pore pressure regime and gas-phase distribution - the South Shetland Margin (Antarctica) case study
- S. Anandkrishnan** - Crustal structure of the West Antarctic rift system and Marie Byrd Land hotspot
- J. Behrendt** - Future Aerogeophysical Surveys are Needed over the West Antarctic Rift System in the Area covered by the West Antarctic Ice Sheet (WAIS) and the Ross Ice Shelf
- G. Brancolini** - Sedimentary record and glacial history of the Antarctic continental margin
- L. Federico** - The paleo-pacific margin of Gondwana and the Ross Orogeny: a northern Victoria Land perspective
- R. Greku** - An internal structure of the Antarctica continent and adjacent regions with the gravimetric tomography technique
- V. Korepanov** - Study of terrigenous influence on ionosphere realized at Ukrainian Antarctic station
- S. Mukasa** - Terranes of West Antarctica
- C. Paredes** - Stochastic three dimensional conditioned distribution of faults potentially responsible for the seismo-volcanic activity in Deception Island
- R. Palmeri** - Preliminary stable isotope investigation of the ultra-high-pressure metamorphic rocks from the Lanterman Range, NVL, Antarctica
- D. Praeg** - Episodic Cenozoic tectonism and the shaping of the NW European "passive" continental margin
- M. Rebesco** - Western margin of the Antarctic Peninsula: an opportunity for seafloor bathymetric mapping and the new frontier of fluid escapes and mud volcanoes
- F. Salvini** - Architecture, Kinematics, and Timing of Intraplate Strike-Slip Tectonics at the Northeastern Edge of Antarctica
- C. Sauli** - Revision of seismic data interpretation in the Victoria Land Basin (Western Ross Sea)
- C. Siddoway** Modular conversion method for regional comparison of structural data across the Ross Sea (e.g. TAM at ~160°E longitude versus MBL at 145°W)
- F. Talarico** - A major crustal discontinuity in George V Land: new petrological and geochronological data and new research opportunities
- U. Tinivella** - Estimate of the potentiality of gas hydrate and free gas reservoir by integrated seismic analyses
- L. Viereck-Götte** - Geodynamics of the West Antarctic Rift System (WARS) in Remote Ellsworth Land and its implications for the stability of the West Antarctic Ice Sheet
- N. Wardell** - A web-based interactive Antarctic seismic database

Poster Session II: Glacial Geology, Paleoenvironments, and Climate Change

Tuesday 10:30 – 11:30

- S. Ceramicola** - 2D flexural backstripping of the glaciated NW European margin (EC STRATAGEM Project)
- L. De Santis** - Ice Sheet load, erosion, and deposition effects on sedimentation: geophysical and geological integrated approach (or 6C)
- M. Hannah** - Marine palynomorphs: studies from the Antarctic margin
- F.J. Hernandez-Molina** - Spanish marine geological investigations of the Antarctic continental margins and basins: main stratigraphical results related to environmental and paleoceanographical changes
- P.C. Pertusati** - Early Jurassic fossiliferous black shales in the Exposure Hill Formation, Ferrar Group of Northern Victoria Land, Antarctica
- S. Picotti** - A seismic survey test on the eastern Antarctic Ice Sheet for subglacial lake exploration
- C. Ribecai** - Jurassic miospores from Carapace Nunatak, Victoria Land, Antarctica
- M. Siegert** - ACE: Antarctic Climate Evolution
- J. Thiede** – Aurora Borealis – A novel European research Icebreaker

All posters will be on display for viewing and discussion throughout the whole duration of the workshop.

FORUM:

Keeping Geology & Geophysics strong in future Antarctic research

An objective for the workshop is to discuss challenges and identify strategies for maintaining a strong role for geology and geophysics in future Antarctic research. A strong basis for discussions will come from the workshop's **opening session**, which will serve to identify priorities and suggest possibilities for the next decade of Antarctic research, including the International Polar Year (IPY) in 2007-08. Speakers include members of the Scientific Committee on Antarctic Research (SCAR); representatives of the British Antarctic Survey (BAS) and South American research community; and proponents of IPY projects and national facilities. **Keynote talks** on day 1 will 1) feature the multinational ANDRILL (ANTarctic DRILLing) initiative for stratigraphic drilling and 2) offer an extra-Antarctic (Himalayan) example of structural geological research that describes broadly applicable techniques for investigation of *general flow* as a fundamental orogenic process.

The **forum** scheduled on the first afternoon of the workshop will begin with remarks from a **multinational panel** of Antarctic scientists, experienced in international collaborations and in national program planning, who will set the stage for general **discussion**. We encourage all participants to contribute to conversations about research challenges; important geology/ geophysics initiatives; and key areas for future interdisciplinary and collaborative efforts. Topics to be addressed may also include trends in funding and national program priorities, and the need for communication, outreach and education in the public and political sectors; implementation of new technologies; preparation of electronic data repositories for international access; and future research targets. **Keynote lectures and topical sessions** on the following days of the workshop illustrate the innovative approaches, interdisciplinary and collaborative efforts that have been the hallmark of Antarctic earth sciences research for more than 50 years. We request that presenters reflect upon and take opportunities to directly address the workshop's aim of discovering ways to surmount the challenges of competitive research funding and changing national priorities, and to emphasize strategies for reaching frontiers and pursuing opportunities in Antarctic earth sciences research.