

**DGP-Förderung Nachwuchswissenschaftler:
Vorträge und Poster bei ISAES X in Santa Barbara, 26.-
31.8.2007**

Abstracts

Benjamin Bomfleur (Geologisch-Paläontologisches Institut, Westfälische Wilhelms-Universität Münster), Jörg Schneider, Robert Schöner, Lothar Viereck-Götte, Hans Kerp: Exceptionally well-preserved Triassic and Early Jurassic floras from North Victoria Land, Antarctica

This extended abstract gives an overview about newly discovered fossil floras from the Triassic and Lower Jurassic of North Victoria Land, Antarctica. The most important finds comprise a cuticle-bearing *Dicroidium*-flora and cuticle-bearing benettitalean-dominated floras as well a deposit with structurally preserved dipterid ferns and cycadophytes. Highly remarkable is the excellent state of preservation of these floras which is rarely found elsewhere in the Lower Mesozoic of Gondwana.

Lars Ganzert (Periglazial-Forschungen, Alfred-Wegener-Institut für Polar- und Meeresforschung Potsdam) und Dirk Wagner: Microbial communities in different Antarctic mineral deposits characterised by denaturing gradient gel electrophoresis (DGGE)

A culture-independent method was used to assess the bacterial diversity in different mineral deposits of Livingston Island, Antarctica. One transect and four separate profiles were investigated. Total carbon and nitrogen were extremely low (<0.23 %), whereas the water content ranged from 1.4 % up to 35 % with variations within single profiles. In two profiles permafrost was present in the deepest part (from 20 and 35 cm, respectively) of the sediments. DNA was recovered directly from mineral deposits and used as template for the amplification of bacterial 16S rRNA gene fragments. The mixture of 16S rRNA gene fragments was separated via denaturing gradient gel electrophoresis (DGGE). The DNA fingerprints showed a high number of bands that decrease with increasing depth, except for two single profiles, where no change within the profile could be observed.

Ricarda Hanemann (Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena) und Lothar Viereck-Götte: Evolution of low-Ti and high-Ti rocks of the Jurassic Ferrar Large Igneous Province, Antarctica: Constraints from crystallisation experiments

The Jurassic Ferrar Large Igneous Province comprises two compositionally distinct magma series. In order to describe the differentiation history of these low-Ti and high-Ti series, equilibrium crystallisation experiments have been performed at 1100 deg C and 2 kbar in internally heated pressure vessels. The experiments were conducted under variable redox conditions and water activities using a chilled margin sample from a low-Ti sill in northern Victoria Land as starting material. The phase relations and phase compositions of

the experimental products exhibit systematic variations with changing run conditions. Based on the comparison of the experimental results with the compositional differences analysed in the natural low-Ti and high-Ti rocks, a model is proposed after which the high-Ti magmas differentiated under lower oxygen fugacity and water activity at lower pressures compared to the low-Ti magmas.

Ricarda Hahnemann (Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena) und **Lothar Viereck-Götte**: **Platingroup elements in sills of the Jurassic Ferrar Large Igneous Province from northern Victoria Land, Antarctica**

Platinum group elements (PGE) abundances were analyzed in basaltic andesites and andesites from sills of the Ferrar Large Igneous Province (FLIP) from northern Victoria Land. The strongly fractionated primitive mantle-normalised PGE-patterns show enrichment of the Pt-PGE over the Ir-PGE. The single element abundances exhibit good correlations with the degree of differentiation of the distinctly evolved samples and are interpreted to result mainly from low-pressure in-situ differentiation after upper-crustal magma emplacement. Compared to tholeiitic rocks from other magmatic provinces, only the FLIP rocks exhibit coupled enrichment of Pd, Pt and Cu even in most evolved samples. The decrease of Pt and Pd in some of the more evolved samples does not necessarily signify sulphide fractionation, but may indicate the formation of other PGE-compounds. The inferred sulphur-undersaturated conditions during differentiation are in agreement with the elevated melting degrees as well as the refractory nature of the proposed subcontinental lithospheric mantle source.

Donata Helling (Alfred-Wegener-Institut für Polar- und Meeresforschung Bremerhaven) und **Gerhard Kuhn**: **Geochemical variations detected with continuous XRF measurements on ANDRILL AND-1B core - preliminary results**

Antarctica and especially its ice sheets play a major role in the global ocean current system and climate. The ANDRILL (Antarctic Geological Drilling) MIS deep drillig projekt (McMurdo Sound, NE Ross Ice Shelf, drilled vore AND-1B during austral summer 2006/2007) is located in a flexural moat basin filled with sediments of different origins. For the first time, sediments beneath an ice shelf were drilled, which provides a unique opportunity to investigate the Ross Ice Shelf variability. During the drilling phase, major and minor elements were measured using a non-destructive X-Ray Fluorescence Core Scanner. The core covers a time period much longer than any Antarcitic ice core record. The high-resolution data set of XRF-core scans allows estimating climate changes on small time scales. This report covers the early stage of the project, focus mainly on data preparation and correction and gives a first rough interpretation of the measured data.

Diana Magens (Alfred-Wegener-Institut für Polar- und Meeresforschung Bremerhaven) und **Frank Niessen**: **Determination of and preliminary results from the high-resolution physical properties record of the**

AND-1-1B sediment core from beneath Ross Ice Shelf, Antarctica

A more than 1200 m long sediment core was drilled beneath McMurdo Ice Shelf near Ross Island (Antarctica) in austral summer 2006/07 (ANDRILL-MIS Project). High-resolution whole-core physical properties were determined as one set of parameters were measured using a multi-sensor core logger: acoustic velocity, wet-bulk density, non-contact electrical resistivity and magnetic susceptibility. Data quality was routinely controlled by measurement of standards. Deviations from the reference values are minimal with regard to the whole spectrum of sediment data points and no offsets between core diameter intervals are obvious. Almost all boundaries between lithostratigraphic units are in good agreement with changes in the physical properties record. For the depth interval between 140-300 mbsf the physical properties indicate rhythmic changes in the environmental system with alternations of diatomite and diamictite sequences.

Jan Müller (Institut für Planetare Geodäsie, TU Dresden), Sven Riedel, Mirko Scheinert, Martin Horwarth, Reinhard Dietrich, Daniel Steinhage, Helgard Anschutz, Wilfrid Jokat: Regional geoid and gravity field from a combination of airborne and satellite data in Dronning Maud Land, East Antarctica

A variety of gravity observations in Antarctica has recently become available through extensive efforts of airborne surveys. Aircraft serving as multi-instrumentation platforms provide measurements on gravity, bedrock topography, ice surface topography and ice thickness. Collected datasets are valuable in terms of resolution and homogeneity, which make them suitable for studying regional geoid determination in selected Antarctic regions. Within this context the German joint project VISA provided an excellent database for improving the regional geoid by combining gravity and topographic data from aerogeophysical observations with long-wavelength information from global gravity field models. Using the remove-compute-restore technique in conjunction with least-squares collocation, a regional geoid for Dronning Maud Land, East Antarctica, has been derived. A signal threshold of up to 6 m added to the global model that was used as a basis can be expected. The accuracy of the regional geoid will be estimated to be at the level of 15 cm.

Sabrina Ortlepp (Institut für Geologie und Mineralogie, Universität zu Köln), Bernd Wagner, Martin Melles, Peter Doran, Fabien Kenig: Late Quaternary environmental history of Taylor Valley, southern Victoria Land, Antarctica, reconstructed by a multidisciplinary study of lake sediments

Sedimentological, biogeochemical, mineralogical, and chronological investigations were conducted on sediment sequences recovered from lakes Hoare and Fryxell in eastern Taylor Valley, southern Victoria Land, Antarctica. The sediment sequences provide crucial information to the environmental history of Taylor Valley back into the Middle Weichselian. At that time, eastern Taylor Valley was occupied by the large proglacial Lake Washburn, since the advanced Ross Sea Ice Sheet dammed the valley outlet. Lake Washburn was mainly fed by

meltwater and had an oscillating lake level probably depending on climate variations. Cold and dry climatic conditions during the Last Glacial Maximum likely led to a pronounced lake-level lowering due to evaporation. With the final retreat of the Ross Sea Ice Sheet during the Holocene, Taylor Valley was occupied by remnants of Lake Washburn. Environmental conditions comparable to those of today, with an advanced Canada Glacier separating lakes Hoare and Fryxell, established during the late Holocene.

Robert Schöner (Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena), Lothar Viereck-Götte, Jörg Schneider, Benjamin Bomfleur: Triassic-Jurassic epiclastic and volcanoclastic deposits in North Victoria Land, Antarctica: A revised stratigraphic model

Field investigations in North Victoria Land, Antarctica during GANOVEX IX (2005/2006) allow the revision of the Triassic-Jurassic stratigraphy of ca 300 m thick continental deposits in between the crystalline basement and the Kirkpatrick lava flows of the Ferrar Group. The lower stratigraphic unit (Section Peak Formation) is characterised by braided river-type quartzose sandstone deposits with intercalations of shale and coal occurring at the top. It is overlain by a homogeneous unit of reworked silicic tuffs (new informal name: „Shafer Peak Formation“). These deposits can be correlated with parts of the Hanson Formation in the Central Transantarctic Mountains. Clastic products of mafic volcanic eruptions, formerly described as a separate stratigraphic formation (Exposure Hill Formation), occur within local diatreme structures as well as intercalated in multiple stratigraphic levels within the sedimentary succession. These dominantly hydroclastic eruptions are the first subaerial expression of Ferrar magmatism.