Summer school

From Dredging to Deep-Sea Mining
6 – 10 July 2015
Organizing Committee

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*Rector, State Higher Education Institution "National Mining University", Ukraine*

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Welcome

Being a University of Resources and the oldest existing mining science university in the world, TU Bergakademie Freiberg focuses comprehensively on securing the supply of natural resources along the entire value-added chain. Today we prepare to meet challenges in mining industry which might be ‘on the table’ in the nearest future. Geological uncertainty, high and growing costs for exploration, exhausting easy-to-access mineral deposits, worsening economic feasibility of mine development, the need for critical raw materials – all this compels to pay our attention to the mineral wealth of the seas and oceans, reserves of which are becoming increasingly important.

This year for the first time in TU Bergakademie Freiberg we are offering new studying program – Summer School “From Dredging to Deep-Sea Mining”, which is aimed at improving the knowledge of students and young researchers from different countries in new promising field of human activity – deep-sea mining. It will enable young generation of miners to become acquainted with advanced technologies for exploration, mining and processing of seabed minerals, as well as with environmental, economical, legislative and political aspects of deep-sea mining. The Summer School will be realized within the context of seminars and practical trainings, which will be held by top-level scientists from Germany, United Kingdom, Slovakia, Romania, Russia, Bulgaria, and Ukraine. Visits to German mining companies are planned.

As the result we expect increase of students’ knowledge and development of their interest on the considered problems, the strengthening of international relations between participants involved, analysis of the state of the mining industry and ways of its further development on a global scale. We hope this Summer School become a new good tradition, which will enable to make a positive contribution to the benefit of the society.

Prof. Dr. Carsten Drebenstedt

Dean of the Faculty of Geosciences, Geoengineering and Mining of TU Bergakademie Freiberg, Coordinator of the Summer School
About the Summer School

Aims

The Summer School “From Dredging to Deep Sea Mining” is an initiative aimed at the development and promotion of both theory- and practice-based studies. By bringing together the leading scholars in the field, the School aims to become a centre for the elaboration and dissemination of knowledge in deep-sea mining, covering such aspects as methods and technologies for mining and processing of underwater minerals, marine exploration, and environmental, economical, legislative and political aspects of deep-sea mining.

The School is organised in collaboration with the following universities and organisations: GEOMAR Helmholtz Centre for Ocean Research (Germany), Soil Machine Dynamics Ltd
(United Kingdom), Technical University Kosice (Slovakia), University of Petrosani (Romania), National Mineral Resources University (Russia), Institute of Oceanology – Bulgarian Academy of Sciences (Bulgaria), and State Higher Education Institution "National Mining University" (Ukraine).

Who should attend?

The Summer School is an ‘advanced studies’ initiative aimed at participants who have some familiarity with mining and are interested to further explore the topic and learn about the most recent developments in underwater mining.

Concept and approach

Self-development through acquiring knowledge and creative self-expression is the main principle of the Summer School. Active participation, open dialogue, discussion, and joint exploration generate learning and enrichment for all participants: experienced scholars (lecturers), young researchers and students. Intensive practice training and visits of mining companies are planned. Moreover, the School will acquaint foreign participants with German culture, main principles of educational process and research, and advanced research equipment.
Fees

The Summer School will be run with a view to providing an exceptional event at minimum cost to participants – 100€ per person. The fees are kept at the minimum necessary to make the Summer School economically viable and cover seminar materials, coffee-brakes and excursions.

Accommodation and services

Costs of accommodation, food and transport (except of planned excursions) are covered by participants on their own. The organizers of the Summer School provide possible supporting in search of accommodation (in hotels and guesthouses) and in obtaining other required services.

How to participate

If you are a student or a PhD Student, to participate you should: contact a responsible person in your organization, fill required form (see Annex), and pay the fee (100 €). Detailed information you can obtain from the contact person in your organization or from the organizers of the Summer School via e-mail sarat.dp@mail.ru.
Our teaching staff

**Prof. Dr. Carsten Drebenstedt**
*TU Bergakademie Freiberg, Germany*

A specialist in mine planning, mining technology and mine water management, e.g. in soil excavation and environmental/sustainability aspects of mining; author of scientific and practical books, including in the field of underwater mining. Marine mining is part of his teaching and research activities.

**Prof. Pavol Rybar**
*TU Kosice, Slovakia*

The representative of the Slovak Republic to the international organization Interoceanmetal in Stetin, which is focused on the mining of seabed nodules in the Clarion-Clipperon Zone (Pacific Ocean), the author of several publications in this field.

**Dr. Stef Kapusniak**
*Soil Machine Dynamics Ltd, United Kingdom*

Business Development Manager – Underwater Mining, with Soil Machine Dynamics Ltd (SMD). He has a PhD in Rock Mechanics and is a qualified Mine Manager. SMD is the world’s leading provider of remote controlled underwater excavation equipment. SMD supplies work-class ROVs, subsea ploughs, trenchers, excavators and underwater mining machines (recently built three deep-sea mining machines for the Nautilus Project – a seafloor massive sulphide mining venture).

**Dr. John Jamieson**
*GEOMAR, Germany*

An economic geologist, specializing in hydrothermal systems and the formation of seafloor massive sulfide deposits, the use of acoustic mapping, and autonomous underwater and remotely-operated vehicles as exploration tools for marine mineral resources.

**Asoc. Prof. Dr. Lucia Domaracka**
*TU Kosice, Slovakia*

A specialist in process control in obtaining and processing Earth resources and economical study of polymetallic nodules in seabed mining.

**Dr.-Ing. Taras Shepel**
*TU Bergakademie Freiberg, Germany*

A mining mechanical engineer with experience in developing equipment for the deep-sea mining of polymetallic nodules and organic-mineral sediments; a specialist in mining of deep-sea minerals with bucket dredgers.
### Program

#### Sunday (05.07.15)

**ARRIVAL OF PARTICIPANTS**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>14.00–15.00</td>
<td>Familiarity with Freiberg</td>
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<tr>
<td>15.00–18.00</td>
<td>Visiting the Mineral Exhibition Terra Mineralia</td>
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<td>Free time</td>
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#### Monday (06.07.15)

**SYSTEM “LAND AND WATER”. SPECIFICITY OF DEPOSITS**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9.00 – 10.30</td>
<td>Opening of the Summer School. Approval of the work program. Assignment of tasks.</td>
</tr>
<tr>
<td>11.00 – 12.30</td>
<td>Topic 1: Specificity of Underwater Deposits of Mineral Resources</td>
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<tr>
<td>12.30 – 14.00</td>
<td>Lunch time</td>
</tr>
<tr>
<td>14.00 – 15.30</td>
<td>Topic 2: Economic Background of Deep-Sea Mining</td>
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<tr>
<td>16.00 – 17.30</td>
<td>Topic 3: Legal Aspects of Deep-Sea Mining</td>
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<td>Free time</td>
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#### Tuesday (07.07.15)

**UNDERWATER MINING**

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<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9.00 – 10.30</td>
<td>Topic 4: Mining in Shallow Water</td>
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<tr>
<td>11.00 – 12.30</td>
<td>Topic 5: Exploration of Deep-Sea Minerals</td>
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<tr>
<td>12.30 – 14.00</td>
<td>Lunch time</td>
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<tr>
<td>14.00 – 15.30</td>
<td>Topic 6: Mining System on seabed</td>
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<tr>
<td>16.00 – 17.30</td>
<td>Topic 7: Risks of Mining Methods for Deep Sea Bottom and New Approaches</td>
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<td>Free time</td>
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#### Wednesday (08.07.15)

**VISITING GEOMAR HELMHOLTZ CENTRE FOR OCEAN RESEARCH (KIEL)**

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<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>6.00 – 13.00</td>
<td>Departure from Freiberg – arrival to Kiel</td>
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<tr>
<td>13.00 – 17.00</td>
<td>Familiarization with: marine exploration methods and equipment; research vessels; current investigations of deep-sea minerals in GEOMAR.</td>
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<tr>
<td>17.00 – 24.00</td>
<td>Departure from Kiel – arrival to Freiberg</td>
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<td>Free time</td>
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#### Thursday (09.07.15)

**TRANSPORTATION AND PROCESSING**

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<th>Time</th>
<th>Activity</th>
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<tr>
<td>9.00 – 10.30</td>
<td>Topic 8: Vertical Transport Methods</td>
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<tr>
<td>11.00 – 12.30</td>
<td>Topic 9: Processing of Underwater Minerals</td>
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<tr>
<td>12.30 – 14.00</td>
<td>Lunch time</td>
</tr>
<tr>
<td>14.00 – 18.00</td>
<td>Excursion to mining companies</td>
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#### Friday (10.07.15)

**ENVIRONMENTAL PROTECTION**

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<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9.00 – 10.30</td>
<td>Topic 10: Marine Ecosystem</td>
</tr>
<tr>
<td>11.00 – 12.30</td>
<td>Topic 11: Environmental Aspects of Seabed Mining</td>
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<tr>
<td>12.30 – 14.00</td>
<td>Lunch time</td>
</tr>
<tr>
<td>14.00 – 15.30</td>
<td>Summarizing the results. Completion of the Summer School</td>
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#### DEPARTURE OF PARTICIPANTS
Map of Freiberg

1 – Railway Station;
2 – Institut für Bergbau und Spezialtiefbau (Summer School);
3 – Library;
4 – Mensa (refectory);
5 – Mineral Exhibition “Terra Mineralia”
Glück auf!
See you in Freiberg!

Contacts:

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