



40TH ANNIVERSARY • UMI 2011 • HILO, HI UNDERWATER MINING INSTITUTE

FINAL PROGRAM

UPDATED 15 SEPT 2011

14 September 2011 (Wednesday)

WELCOMING RECEPTION AND REGISTRATION

Moku'ola Room, Hilo Hawaiian Hotel

Hilo, Hawai'i USA

7:00 – 9:00 PM

Nā Mea Hula o Kahikinaokalālani

Kumu Hula: Karla Kahikinaokalālani Kel'iho'omalua Akiona

15 September 2011 (Thursday)

TECHNICAL SESSION I

Hilo Hawaiian Hotel

8:30 AM to 6:00 PM

(7:30 AM Breakfast opens, Queen's Court, ticket required)

8:30 WELCOME

Call to Order

Charles L. Morgan
UMI Program Chair

Welcoming Address

John Wiltshire
Hawaii Undersea Research Laboratory

Introductory Remarks

Charles L. Morgan



Presentations

8:50 KEYNOTE ADDRESS

Kim, Woong-Seo

Vice-President, Korea Ocean Research & Development Institute (KORDI)

9:05 Road Map to Successful Commercial Deep Ocean Mining

John Halkyard, (Eric Jackson, Speaker)

Deep Reach Technology, Inc., USA

9:30 IHC Merwede and DEME Join Forces to Develop Deep-Sea Mining Activities

Kris van Nijen

OceanfLORE, Singapore

9:55 The Developing Deep Sea Mining Systems

Hans Smit

IHC Marine and Mineral Projects (Pty) Ltd, South Africa

10:20 Break

10:50 Resource Drilling of the Solwara 1 Seafloor Massive Sulfide (SMS) Deposit

Glen Smith

Nautilus Minerals Inc., Australia

11:15 Vertical Hydraulic Transport for Deep Sea Mining Applications

Paul M. Vercrujisse (Stanislav Verichev, Speaker)

MTI Holland/IHC Merwede, The Netherlands

11:40 The Strength Characteristics of Deep Seabed Sediment

Ivo Dreiseitl

Interoceanmetal Joint Organization, Poland

12:05 Extraction of Valuable Trace Metals from Ferromanganese Nodules and Crusts with Different Chemical Leaching Agents

Andrea Koschinsky

Jacobs University Bremen, Germany

12:30 Break for Lunch, Queen's Court

2:00 Deepsea Mining, for the Benefit of Mankind

Robert Heydon

DeepGreen Resources Inc., Australia

2:25 Conceptual Study of Innovative Ecological Manganese Nodule Mining System

Tetsuo Yamazaki

Osaka Prefecture University, Japan

2:50 Deep Sea Exploration New Technologies

Leonhard Weixler

BAUER Maschinen GmbH, Germany

3:15 Borehole Mining of Manganese at Subzero Temperatures

Gregory Abramov

Borehole Mining International, Inc., USA

3:40 Break

4:10 Mineral Processing of Seafloor Hydrothermal Deposit Samples -Treatment Using Gravity Separation and Flotation Methods

Mayumi Ito (Shuji Futakuchi, Speaker)

Hokkaido University, Japan

4:35 High-Resolution Side-Scan Mapping of Large Areas of the Mid-Atlantic Ridge Using a Fleet of Autonomous Underwater Vehicles (AUVs)

Sven Petersen

Leibniz Institute of Marine Sciences, Kiel, Germany

5:00 Application of High Resolution Element Analysis of N-E Pacific Sediments

In Kwon Um

Korea Institute of Geoscience and Mineral Resources, Korea

5:25 The New Exclusive Economic Zone Gas and Mineral Deposits a Target for New Exploration

Alexander Malahoff

GNS Science, Wellington, New Zealand

5:50 Technical Session I Closing Remarks

Charles Morgan

15 September 2011 (Thursday)

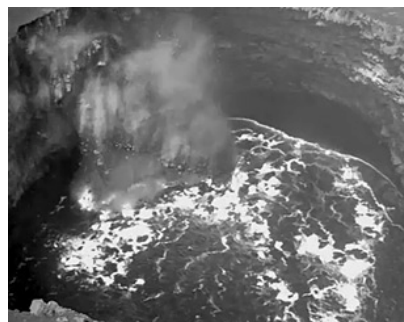
KALAPANA LAVA WALK

6:00 PM to 9:30 PM (*optional, prepayment required*)

Buses Leave promptly

Possible lava viewing at Kalapana, boxed dinners, Park Ranger presentation.

Dress warm and comfy, wear walking shoes, bring along your UMI umbrella and poncho, some flashlights provided.



Total Participants as of 9/15/11: 88

| | | |
|--|----------------------------------|---|
| Gregory and Irina Abramov | Bart Hogeweg | Irina Pulyaea and Nikolay |
| Ray Binns | Mayumi Ito | Winston Rocher and Giedra Ozalaite |
| Simon Boel | KORDI, Kim, Woong-Seo | Steve and Joan Scott |
| Tim Boyd and Family (total 4) | KORDI - Chi, Sang Bum | Glen Smith |
| Mayumy Cabrera and Aristoteles Jaramillo | KORDI – Cho, Hyeondong | Samantha Smith |
| Arturo Carranza-Edwards | KORDI – Hwang, Inju | Kaiser Souza |
| Sophia Casanova | KORDI – Jo, Haechang | Shinichi Takagawa |
| Georgy Cherkashov | KORDI – Kim, Hyun Sub | Stanford Tassie |
| Hunsoo Choi | KORDI – Lee, Kwang-Min | Virginie Tilot |
| Robert Denovan | KORDI – Pak, Sang Joon | Um, Inkwon |
| Cornel de Ronde | KORDI – Lee, Jun Kyu | Akira and Satako Usui |
| KORDI: Jang, Dosoo | Andrea Koschinsky | Gary Van Eck |
| Robert Ditchburn | Toby Lambooy | Joyce Van Heijzen |
| Kiernan Douglas | Sung Rock Lee | Kris Van Nijen |
| Philippe Espinasse | Alexander Malahoff (Lead) | Stanislav Verichev |
| Robin and Ferial Falconer | Campbell McKenzie | Philomene Verlaan |
| Lee Fausak | Charles, Karynne, Lei Morgan | Hu Wang |
| Shuji Futakuchi | Mussett, Mark | Leonhard Weixler |
| Robert Goodden and Beatrice Brandt | Marlene Olivares and Ullis Gomez | Charlene Wildman |
| Bas Hemmen | Rich Patterson | Peter Williamson |
| Robert Heydon | Sven and Sabine Petersen | 9/15 ADD: Barriga, Parsons, Hong, Heydon, Okamoto |
| Alan Hilton | Daria Pulyaeva and Seif Mahmoud | Tetsuo Yamazaki and Nobu Okamoto |

Final Program (as of 09/14/11) · 4

UMI 2011· Hilo Hawaiian Hotel· 14-18 September 2011

16 September 2011 (Friday)

TECHNICAL SESSION II

8:30 AM to 6:00 PM

(7:30 AM Breakfast opens, Queen's Court, ticket required)

(Concurrent with Technical Session II is the *Highlights of Hilo Tour* for spouses and guests, 10:00 am – 3:00 pm)



**8:30 International Marine Minerals Society:
Annual General Membership Meeting**
Georgy Cherkashov, President

Presentations

9:10 Rock Phosphate: Chatham Rise, New Zealand
Chris Castle (Robin Falconer, Speaker)
Chatham Rock Phosphate Ltd., New Zealand

9:35 Observation and Sampling of Seamount Ferromanganese Crusts with a Remotely Operated Vehicle (ROV): Advantages for Geochemical and Geological Characterization
Akira Usui
Kochi University, Japan

10:00 Features of Distribution Pattern of Cobalt-rich Ferromanganese Crusts on the Micronesian and Marshall Islands Seamounts
Nobuyuki Okamoto
Japan Oil, Gas and Metals National Corporation, Japan

10:25 Fe-Mn Crusts of the Pacific and Atlantic Ocean: Geo-historical Aspects of Their Formation /or Formation Conditions of Potential Fe-Mn Deposits of the Pacific and Atlantic Ocean
Irina A. Pulyaeva
SSC Yuzhmorgeologia, Russia

10:50 Break

11:15 Alteration in the Nodule Coverage Due to Biogenic Disturbance in the IOM Exploration Area: Some Environmental Concerns
Valcana Stoyanova
Interoceanmetal Joint Organization, Poland

11:40 Pelagic Sediments Associated with Polymetallic Nodules in the Clarion Area Fracture Zone

Marlene Olivares

Universidad Nacional Autónoma de México, Mexico

12:05 Mineralogy of Polymetallic Nodules in the Central Mexican Pacific

Mayumy Cabrera

Universidad Nacional Autónoma de México, Mexico

12:30 Break for Lunch, Queen's Court

1:30 Poster Session

Poster Presentations

Finding Inactive and Sub-Seafloor Massive Sulfide Deposits in Deep Ocean Floors

Fernando Barriga

University of Lisbon, Portugal

An Innovative Seafloor Drill System for Offshore Geotechnical Site Investigation and Seafloor Mineral Exploration

Tim Boyd

Gregg Marine, Inc., USA

Sediment Geochemistry Associated with Polymetallic Nodules in the Central Mexican Pacific

Arturo Carranza-Edwards

Universidad Nacional Autónoma de México, Mexico

The Selection of the Benthic Environmental Impact Testing Site in the Korea Contracted Area, Clarion-Clipperton Zone

Sang Bum Chi

Korea Ocean Research and Development Institute, Korea

Can Radium Isotopes Give Insight into Volcanic and Hydrothermal Processes and the Sustainability of Metal-Rich Sulfide Mineralization?

Robert G. Ditchburn

GNS Science, Lower Hutt, New Zealand

Comparative Study on Mining Robots Design for Polymetallic Nodules and Seabed Massive Sulfides

Sup Hong

Korea Ocean Research and Development Institute, Korea

Geophysical Investigations over Segments of the Central Indian Ridge: High Resolution Bathymetry and Magnetic Survey

Hyun Sub Kim

Korea Ocean Research and Development Institute, Korea

Rare Metal Contents of Deep-Sea Mineral Resources Explored By Korea and Their Implications for Exploitation

Sang Joon Pak

Korea Ocean Research and Development Institute, Korea

Ocean Mining, Undersea Mining or Offshore Mining in the Chilean National Legislation, in the International Law and Its Technological Progress

Winston Rocher

University of Chile, Chile

Recommendations for the Conservation and Management of the Biodiversity of Deep Sea Ecosystems Targeted by Seabed Mining (Polymetallic Nodule Deposits, Cobalt-Rich Ferromanganese Crusts and Hydrothermal Sulfides)

Virginie Tilot

Académie des Sciences d'Outre-Mer, France

Fundamental Study of UV-fluorescence Sensing System for Seafloor Massive Sulfides

Tetsuo Yamazaki

Osaka Prefecture University, Japan

Presentations - continued

2:30 Obtaining Approval for Deep Water Seafloor Mineral Extraction: The Solwara 1 Example

David Gwyther and Samantha Smith

Coffey Environments, Australia and Nautilus Minerals, respectively

2:55 Prospectivity Modeling of Seafloor Massive Sulphide (SMS) Deposits in the Kermadec Arc and Colville Ridge Regions, New Zealand

Charlene Wildman (Introduction by Campbell McKenzie)

Kenex Ltd, New Zealand

3:20 Hydrothermal Activity and the Formation of Massive Sulfide Mineralization at Clark Volcano, Kermadec Arc, New Zealand

Cornel de Ronde

GNS Science, New Zealand

3:45 Sulfur Isotope Ratio Measurements as an Exploration Tool for High-Tenor Seafloor Massive Sulfide Deposits

Raymond A. Binns

CSIRO Earth Science and Resource Engineering, Australia

4:10 Break

4:35 Zinc-Lead-Silver-Gold-Rich Barite Deposits in East Diamante Caldera, Mariana Volcanic Arc

James R. Hein

U.S. Geological Survey, USA

5:00 A New Concept of Easy Pre-Site Survey Method of Deep Sea Hydrothermal Deposits

Shinichi Takagawa

The University of Tokyo, Japan

5:25 Seafloor Massive Sulfides and Oceanic Core Complexes at the Slow-Spreading Ridges

Georgy Cherkashov

Institute for Geology and Mineral Resources of the Ocean, Russia

5:50 Closing Remarks and End of Technical Sessions

Charles Morgan

16 September 2011 (Friday)

UMI BANQUET – 6:30 PM

‘Imiloa Astronomy Center

Grab your tickets--buses leave Hilo Hawaiian at 6:15 PM. Buffet dinner, special International Marine Minerals Society Moore Award ceremony, and Banquet Address by:

Dr. Steven D. Scott, University of Toronto

Dr. Norman B. Keevil Professor Emeritus of Ore Genesis Geology, former President of the International Marine Minerals Society, McRae Quantec Emeritus Professor of Geology, past Chair of Geological and Mineral Engineering (now Lassonde Program in Mineral Engineering), past Chair of the Department of Geology and Director of the Scotiabank Marine Geology Research Laboratory

9:30 Adjournment of the 40th UMI

Return to Hilo Hawaiian Hotel



17 September 2011 (Saturday)

UMI FIELD TOURS (1 TO KA'U AND 1 TO MAUNAKEA)

(optional, prepaid)



Kea'au to Ka'u Tour

10:30 AM to 8:30 PM

Host: John Wiltshire, Director

Hawai'i Undersea Research Laboratory

Jack's Tours Mini-bus and Car Rentals

Includes: Boxed lunch, dinner, visit to Hawai'i Tropical Botanical Gardens, other stops along the way to a Ka'u hideaway where a small test bed of koa trees are grown in manganese metallurgical process tailings. Dress comfortably, wear walking shoes, and prepare for possible rain, a chill in the air as the evening progresses, and somewhat rustic, yet fun setting.

Ka'u Tour members as of 9/14/11: 30 persons

| | |
|--|-----------------------------------|
| Steven Ball | Daria Pulyaeva & Seif Mahmoud |
| Mayumy Cabrera & Aristoteles Jaramillo | Irina Pulyaeva & Nikolay Pulyaeva |
| Arturo Carranza-Edwards | Steve and Joan Scott |
| Hunsoo Choi | Virginie Tilot |
| Kiernan Douglas | Inkwon Um |
| Karsten Ewald | Satako Usui |
| David and Janet Gwyther | Stanislav Verichev |
| James Hein & Lyn Ackley | Philomene Verlaan |
| Irina Kolotyrkina (tour assistant) | Hu Wang |
| | Charlene Wildman |
| Marlene Olivares & Ullis Gomez | Peter Williamson |
| Sung Rock Lee | John Wiltshire (Lead) |

17 September 2011 (Saturday)

UMI FIELD TOURS (1 TO KA'U AND 1 TO MAUNAKEA)

(optional, prepaid)

Maunakea

10:30 AM to 10:00 PM

*Hosts: Jeffrey Morgan, Senior Telescope Engineer, Pan-STARRS, University of Hawai'i
Institute of Astronomy and
Alex Malahoff, CEO, GNS Science; Professor (emeritus), University of Hawai'i
Department of Oceanography*



Important: Wear sunscreen; sunglasses; protective clothing, including gloves (for sun exposure, quick change in weather, including possible freezing temperatures and high winds); and walking shoes. Do not wander away from the group; use the buddy system. Early registrants will have heavy jackets and gloves provided (see list on next page).

Tour includes: Boxed lunch, dinner, visit to the Onizuka Center for International Astronomy, Keanakakoi (ancient stone quarry summit tour (13,796 feet), one or more telescopes at the Maunakea summit, *Malalo o ka Po Lani* [cultural components of Mauna a Wakea (mountain of Wakea)], and star-gazing.

Some late registrants may not be able to visit more than one observatory at the summit. Those preferring to stay at the Visitor's Center may do so while others go to the Summit. Dinner will be served promptly at 5:15 PM at Hale Pohaku.

Important Advisory: Children under 16, pregnant women, and people with respiratory, heart, or severe overweight conditions are advised not to go higher than the Visitor's Center. At least an hour stop is required at the Center to acclimate to the elevation, which may lessen the intensity or onset of altitude sickness. If you experience any of the following symptoms, do not travel to the summit:

- Headaches
- Nausea
- Loss of balance
- Drowsiness
- Altered mental state
- Impaired reason

Any other symptoms (severe headaches, vomiting, breathing difficulties, coughing, blue lips or fingernails, disorientation, extreme drowsiness) **require immediate descent to a lower elevation.** The only public telephone above the Visitor's Center is at the UH 88-inch Telescope. Cell phone coverage is unreliable on the way to and at the summit.