

Proceedings of the International Ocean Discovery Program

Volume 395

Reykjanes Mantle Convection and Climate

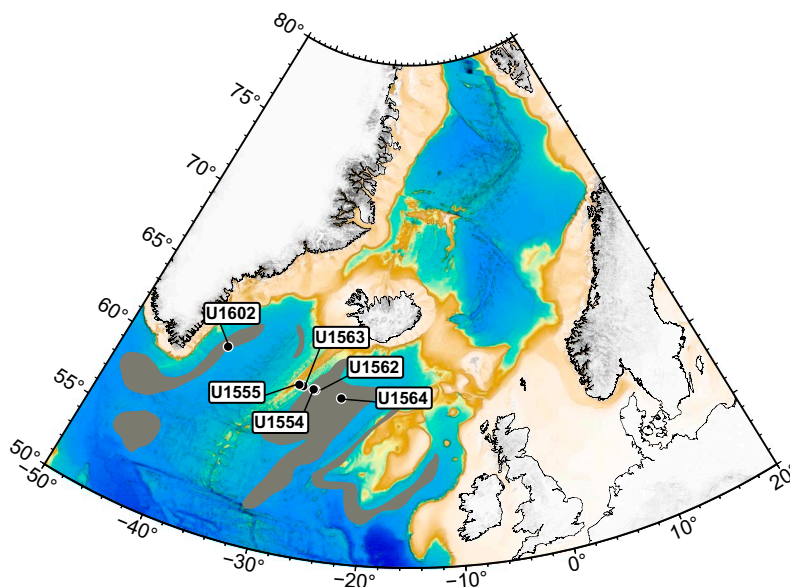
Expedition 384 of the R/V *JOIDES Resolution*
Kristiansand, Norway, to Las Palmas, Canary Islands (Spain)
Sites U1554 and U1555
20 July–24 August 2020

Expedition 395 of the R/V *JOIDES Resolution*
Ponta Delgada, Portugal, to Reykjavík, Iceland
Sites U1554, U1562, U1564, and U1602
12 June–12 August 2023

Expedition 395C of the R/V *JOIDES Resolution*
from and to Reykjavík, Iceland
Sites U1554, U1555, and U1562–U1564
5 June–6 August 2021

Volume authorship

Parnell-Turner, R.E., Briaies, A., LeVay, L.J., and the Expedition 395 Scientists



Publisher's notes

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Australia-New Zealand IODP Consortium (ANZIC)
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The bulk of the shipboard-collected core data from this expedition is accessible at <https://zenodo.org/communities/iodp> (see list of [available data sets](#)). If you cannot access this site or need additional data, please contact Data Librarian, International Ocean Discovery Program *JOIDES Resolution* Science Operator, Texas A&M University (database@iodp.tamu.edu).

A complete set of the logging data collected during the expedition is available at http://mlp.ldeo.columbia.edu/logdb/scientific_ocean_drilling. If you have problems downloading the data, wish to receive additional logging data, or have questions regarding the data, please contact Database Administrator, Borehole Research Group, Lamont-Doherty Earth Observatory of Columbia University (logdb@ldeo.columbia.edu).

Supplemental data were provided by the authors and may not conform to IODP publication formats.

JRSO expedition photos are the property of IODP and are public access.

Some core photographs have been tonally enhanced to better illustrate particular features of interest. High-resolution images are available upon request.

Cover photograph shows contact between ~12 My old olivine phyric basaltic basement and overlying chalk, cored on crustal V-shaped Ridge 3 and Bjorn drift (395C-U1562A-64X-CC). Photo credit: Ross Parnell-Turner and IODP JRSO.

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Core descriptions

Visual core descriptions (VCDs) are presented in PDF files for each site. Thin sections, smear slides, and/or tabular information for each site or hole are presented in tab-separated value (TSV) or PDF format in the CORES directory. The entire set of core images in PDF is available in the IMAGES directory.

Site U1554: [Visual core descriptions](#) · [Smear slides](#) · [Thin sections](#)

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Site U1563: [Visual core descriptions](#) · [Smear slides](#) · [Thin sections](#)

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Site U1602: [Visual core descriptions](#) · [Smear slides](#) · [Thin sections](#)

Supplementary material

Supplementary material for the Volume 395 expedition reports includes cleaned physical properties data and dissolved oxygen concentrations in Microsoft Excel format. A full list of directories can be found in SUPP_MAT in the volume zip folder or on the [Supplementary material for Volume 395 expedition reports](#) web page.

Expedition research results

Data reports

Titles are available in [HTML](#).

Drilling location maps

A site map showing the drilling locations for this expedition and maps showing the drilling locations of all International Ocean Discovery Program (IODP) expeditions, produced using QGIS (<http://www.qgis.org>), and all Integrated Ocean Drilling Program, Ocean Drilling Program (ODP), and Deep Sea Drilling Project (DSDP) expeditions, produced using Generic Mapping Tools (GMT) of Paul Wessel and Walter H.F. Smith (<https://www.generic-mapping-tools.org>), are available in PDF.

[IODP Expedition 395 site map](#)

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[DSDP map](#) (Legs 1–96)

Acknowledgments

Advancing knowledge about Earth's atmosphere, oceans, and deep interior is of critical importance to present and future generations of society. Expedition 395 set out to explore the links between mantle convection, deepwater oceanic circulation, and the evolution of oceanic crust that could only be achieved by scientific ocean drilling. We thank the IODP proposal review panels and the *JOIDES Resolution* Facility Board for their encouragement and support through a review process that began in 2004, leading to the opportunity to access the extraordinary capabilities of the R/V *JOIDES Resolution* to achieve our goals.

All aspects of Expedition 395 were heavily impacted by the COVID-19 pandemic. The success of this expedition was only made possible by the exceptional dedication and sacrifices of the SIEM crew members, *JOIDES Resolution* Science Operator (JRSO) technical and shore-based staff, Schlumberger engineers, and Entier catering teams under unprecedented circumstances, and we deeply thank them.

We thank the captains and crew of *JOIDES Resolution* during Expeditions 384, 395C, and 395 for their commitment and professionalism, and we thank the JRSO shipboard laboratory technicians for their phenomenal attitude and hard work. Finally, we thank the Icelandic Coast Guard for making their vessel *Þór* available to deliver essential drilling equipment during Expedition 395. The geophysical site survey information for Proposal 892 was collected during the NERC-sponsored Cruise JC50 aboard RRS *James Cook* in summer 2010.

Foreword

The International Ocean Discovery Program (IODP) represents the latest incarnation of almost five decades of scientific ocean drilling excellence and is generally accepted as the most successful international collaboration in the history of the Earth sciences. IODP builds seamlessly on the accomplishments of previous phases: the Deep Sea Drilling Project, Ocean Drilling Program, and Integrated Ocean Drilling Program. The 2013–2023 IODP Science Plan (*Illuminating Earth's Past, Present, and Future*) defines four themes and thirteen challenges for this decade of scientific ocean drilling that are both of fundamental importance in understanding how the Earth works and of significant relevance to society as the Earth changes, at least in part in response to anthropogenic forcing. This phase of IODP represents an intense level of international collaboration in bringing diverse drilling platforms and strategies to increasing our understanding of climate and ocean change, the deep biosphere and evolution of ecosystems, connections between Earth's deep processes and surface manifestations, and geologically induced hazards on human timeframes.

The *Proceedings of the International Ocean Discovery Program* presents the scientific and engineering results of IODP drilling projects, expedition by expedition. As in the preceding Integrated Ocean Drilling Program, expeditions in the current IODP phase are conducted by three implementing organizations, each providing a different drilling capability. These are the US Implementing Organization (USIO; through September 2014) and the *JOIDES Resolution* Science Operator (JRSO; as of October 2014), providing the leased commercial vessel *JOIDES Resolution* for riserless drilling operations; JAMSTEC's Institute for Marine-Earth Exploration and Engineering (MarE3), providing the drillship *Chikyu* for riser and occasional riserless operations; and the European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO), providing "mission-specific" platforms (MSPs) for expeditions that extend the IODP operational range where neither drillship is suitable, for example, in polar environments and in shallow waters. Scheduling decisions for each capability are made by three independent Facility Boards, each of which includes scientists, operators, and platform funding partners: the *JOIDES Resolution* Facility Board (JRFB), *Chikyu* IODP Board (CIB), and ECORD Facility Board (EFB). At the beginning of the current IODP, the three Facility Boards agreed to utilize Publication Services at the USIO and now the JRSO for production of all expedition *Proceedings* volumes and reports.

The current IODP differs from prior scientific ocean drilling programs in that it has neither a central management organization nor commingled funding for program-wide activities. Yet this phase of IODP retains a fundamental integrative structural element: a "bottom-up" evaluation of all proposals for drilling expeditions by a single advisory structure composed of scientists representing all international program partners. International scientists may submit drilling proposals to the Science Support Office; all submitted proposals are then evaluated by a Science Evaluation Panel in the context of the Science Plan.

The current IODP also has an international integrative level for high-level discussion and global consensus-building: the IODP Forum. The Forum is not only charged with assessing program-wide progress toward achieving the current Science Plan, but also with overseeing approaches toward a new bright future of scientific ocean drilling post 2023. At present, IODP involves 22 international funding agencies, including those from the United States, Japan, an Australia/New Zealand consortium (ANZIC), China, India, South Korea, and the 15 members of ECORD (Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom). The IODP membership represents an unparalleled level of international scientific collaboration; one of the greatest and ongoing strengths of scientific ocean drilling.

Henk Brinkhuis
Chair, IODP Forum

International Ocean Discovery Program

JOIDES Resolution Science Operator

Website: <http://iodp.tamu.edu>

IODP JRSO

International Ocean Discovery Program
Texas A&M University
1000 Discovery Drive
College Station TX 77845-9547
USA
Tel: (979) 845-2673; Fax: (979) 845-4857
Email: information@iodp.tamu.edu

IODP JRSO Curation and Laboratories

IODP Gulf Coast Repository (GCR)
Texas A&M University
1000 Discovery Drive
College Station TX 77845-9547
USA
Tel: (979) 845-8490; Fax: (979) 845-1303
Email: curator@iodp.tamu.edu

European Consortium for Ocean Research Drilling, Science Operator (ESO)

Website: <http://www.ecord.org>

IODP ESO Coordinator: Science, Logistics, and Operations

British Geological Survey
The Lyell Centre
Research Avenue South
Edinburgh EH14 4AP
United Kingdom
Tel: (44) 131-667-1000; Fax: (44) 131-668-4140
Email: eso@bgs.ac.uk

IODP ESO Curation and Laboratories

IODP Bremen Core Repository (BCR)
Center for Marine Environmental Sciences (MARUM)
University of Bremen
Leobener Strasse
28359 Bremen
Germany
Tel: (49) 421-218-65560; Fax: (49) 421-218-98-65560
Email: bcr@marum.de

IODP ESO Petrophysics

European Petrophysics Consortium
Department of Geology
University of Leicester
Leicester LE1 7RH
United Kingdom
Tel: (44) 116-252-3611; Fax: (44) 116-252-3918
Email: sjd27@leicester.ac.uk

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Website: <http://www.jamstec.go.jp/chikyu/e>

IODP Japan Science Operator

Institute for Marine-Earth Exploration and Engineering (MarE3)
Japan Agency for Marine-Earth Science and Technology
Yokohama Institute for Earth Sciences
3175-25 Showa-machi
Kanazawa-ku, Yokohama
Kanagawa 236-0001
Japan
Tel: (81) 45-778-5643; Fax: (81) 45-778-5704
Email: mare3-exp@jamstec.go.jp

IODP Japan Curation and Laboratories

IODP Kochi Institute for Core Sample Research (KCC)
Japan Agency for Marine-Earth Science and Technology
200 Monobe Otsu
3175-25 Showa-machi
Nankoku City, Kochi 783-8502
Japan
Tel: (81) 88-864-6705; Fax: (81) 88-878-2192
Email: kcc.contact@jamstec.go.jp

Expedition 395 participants*

Expedition 395 scientists

Ross E. Parnell-Turner

Co-Chief Scientist

Institute of Geophysics and Planetary Physics
Scripps Institution of Oceanography
University of California, San Diego
USA

rparnellturner@ucsd.edu

Anne Briais

Co-Chief Scientist

Geo-Ocean Centre National de la Recherche Scientifique (CNRS)
Institut Universitaire Européen de la Mer
France

anne.briais@univ-brest.fr

Leah J. LeVay

Expedition Project Manager/Staff Scientist

International Ocean Discovery Program
Texas A&M University
USA

levay@iodp.tamu.edu

Ying Cui

Organic Geochemist

Department of Earth and Environmental Studies
Montclair State University
USA

cuiy@montclair.edu

Anita Di Chiara

Paleomagnetist

Istituto Nazionale di Geofisica e Vulcanologia
Italy

anita.dichiara@ingv.it

Justin P. Dodd

Inorganic Geochemist

Department of Earth, Atmosphere and Environment
Northern Illinois University
USA

jdodd@niu.edu

Deepa Dwyer

Physical Properties Specialist

College of Earth, Ocean, and Atmospheric Sciences
Oregon State University
USA

shahde@oregonstate.edu

Deborah E. Eason

Petrologist

Department of Earth Sciences
University of Hawai'i at Mānoa
USA

deborae@hawaii.edu

Sarah A. Friedman

Paleomagnetist

School of Earth, Environment and Sustainability
Georgia Southern University Statesboro Campus
USA

sfriedman@georgiasouthern.edu

Sidney R. Hemming

Physical Properties Specialist/Stratigraphic Correlator

Lamont-Doherty Earth Observatory
Columbia University
USA

sidney@ldeo.columbia.edu

Katharina Hochmuth

Downhole Tools/Physical Properties Specialist

Institute for Marine and Antarctic Studies (IMAS)
University of Tasmania
Australia

Katharina.Hochmuth@utas.edu.au

Halima Ibrahim

Sedimentologist

Department of Earth Sciences
Binghamton University
USA

hibrahi6@binghamton.edu

Claire Jasper

Sedimentologist

Lamont-Doherty Earth Observatory
Columbia University
USA

cjasper@ldeo.columbia.edu

Tom Dunkley Jones

Micropaleontologist (nannofossils)

School of Geography, Earth and Environmental Sciences
University of Birmingham
United Kingdom

t.dunkleyjones@bham.ac.uk

Boris T. Karatsolis

Micropaleontologist (nannofossils)

Department of Earth Sciences
Uppsala University
Sweden

Present affiliation (26 February 2024):

Archaeology, Environmental Changes and Geochemistry (AMGC)
Vrije Universiteit Brussel
Belgium

boris.karatsolis@vub.be

Saran Lee

Sedimentologist

Department of Natural Environmental Studies
The University of Tokyo
Japan

lee.saran.587@gmail.com

*Affiliations at time of expedition, except where updated by participants.

†Shore-based participant.

Danielle E. LeBlanc[†]

Sedimentologist

Department of Earth and Environmental Sciences
Boston College
USA

Present affiliation (13 January 2025):
Woods Hole Oceanographic Institution
USA

danielle.leblanc@whoi.edu

Melody R. Lindsay

Inorganic Geochemist

Deep Biosphere Laboratory
Bigelow Laboratory for Ocean Sciences
USA

mlindsay@bigelow.org

David D. McNamara

Downhole Tools/Physical Properties Specialist

Department of Earth, Ocean and Ecological Sciences
University of Liverpool
United Kingdom

d.mcnamara@liverpool.ac.uk

Sevasti E. Modestou

Sedimentologist

Department of Geography and Environmental Sciences
Northumbria University
United Kingdom

sevi.modestou@northumbria.ac.uk

Bramley Murton[†]

Petrologist

Marine Geoscience Group
National Oceanography Centre
United Kingdom

bjm@noc.ac.uk

Suzanne OConnell

Sedimentologist

Department of Earth and Environmental Sciences
Wesleyan University
USA

soconnell@wesleyan.edu

Gabriel T. Pasquet

Petrologist

Complex Fluids and Reservoirs Laboratory
University of Pau and the Adour Region
France

gabriel.pasquet@univ-pau.fr

Paul N. Pearson

Micropaleontologist (planktonic foraminifers)

Department of Earth Sciences
University College London
United Kingdom

p.pearson@ucl.ac.uk

Sheng-Ping Qian[†]

Petrologist

School of Ocean and Earth Science
Tongji University
China

qianshengping@126.com

Yair Rosenthal[†]

Physical Properties Specialist/Stratigraphic Correlator

Institute of Marine and Coastal Sciences
Rutgers, The State University of New Jersey
USA

rosentha@marine.rutgers.edu

Sara Satolli[†]

Paleomagnetist

Department of Engineering and Geology
University of Chieti-Pescara
Italy

sara.satolli@unich.it

Matthias Sinnesael

Physical Properties Specialist/Stratigraphic Correlator

Institut de mécanique céleste et de calcul des éphémérides
(IMCCE)
Observatoire de Paris
France

Present affiliation (24 October 2024):

School of Natural Sciences
Trinity College Dublin
The University of Dublin
Ireland

sinnesam@tcd.ie

Takuma Suzuki

Micropaleontologist (planktonic foraminifers)

Marine Core Research Institute
Kochi University
Japan

jm-takuma_suzuki@kochi-u.ac.jp

Thena Thulasi Doss

Sedimentologist

Geosciences Division
National Centre for Polar and Ocean Research (NCPOR)
India

thenadoss@ncpor.res.in

Nicholas J. White

Physical Properties Specialist

Bullard Laboratories - Department of Earth Sciences
University of Cambridge
United Kingdom

njw10@cam.ac.uk

Tao Wu

Petrologist

Ocean College
Zhejiang University
China

taowu@zju.edu.cn

Alexandra Yang Yang[†]

Inorganic Geochemist

Guangzhou Institute of Geochemistry
Chinese Academy of Sciences
China

yangyang@gig.ac.cn

Shore-based description contributors

Viviane dos Santos Rocha[†]

Callum Pearman[†]

Expedition 395 outreach

Jennifer C. Field

Outreach Officer

Weston High School

USA

fieldj@weston.org

Expedition 395C scientists

Ross E. Parnell-Turner[†]

Co-Chief Scientist Expedition 395

Institute of Geophysics and Planetary Physics

Scripps Institution of Oceanography

University of California, San Diego

USA

rparnellturner@ucsd.edu

Anne Briais[†]

Co-Chief Scientist Expedition 395

Geo-Ocean Centre National de la Recherche Scientifique (CNRS)

Institut Universitaire Européen de la Mer

France

anne.briais@univ-brest.fr

Leah J. LeVay

Expedition Project Manager/Staff Scientist

International Ocean Discovery Program

Texas A&M University

USA

levay@iodp.tamu.edu

Ying Cui[†]

Organic Geochemist

Earth and Environmental Studies

Montclair State University

USA

cuiy@montclair.edu

Anita Di Chiara[†]

Paleomagnetist

Scripps Institution of Oceanography

University of California, San Diego

USA

Present affiliation (12 June 2023):

Istituto Nazionale di Geofisica e Vulcanologia

Italy

anita.dichiara@ingv.it

Justin P. Dodd[†]

Inorganic Geochemist

Department of Earth, Atmosphere and Environment

Northern Illinois University

USA

jdodd@niu.edu

Deborah E. Eason[†]

Petrologist

Department of Earth Sciences

University of Hawai'i at Mānoa

USA

deborae@hawaii.edu

Chia-Yu Tian[†]

Sarah A. Friedman[†]

Paleomagnetist

Department of Biological and Physical Sciences

Montana State University

USA

Present affiliation (12 June 2023):

School of Earth, Environment and Sustainability

Georgia Southern University Statesboro Campus

USA

sfriedman@georgiasouthern.edu

Katharina Hochmuth[†]

Downhole Tools/Physical Properties Specialist

School of Geography, Geology and the Environment

University of Leicester

United Kingdom

Present affiliation (12 June 2023):

Institute for Marine and Antarctic Studies (IMAS)

University of Tasmania

Australia

Katharina.Hochmuth@utas.edu.au

Boris T. Karatsolis[†]

Micropaleontologist (nannofossils)

Department of Earth Sciences

Uppsala University

Sweden

Present affiliation (26 February 2024):

Archaeology, Environmental Changes and Geochemistry (AMGC)

Vrije Universiteit Brussel

Belgium

boris.karatsolis@vub.be

Danielle E. LeBlanc[†]

Sedimentologist

Department of Earth and Environment

Boston College

USA

Present affiliation (13 January 2025):

Woods Hole Oceanographic Institution

USA

danielle.leblanc@whoi.edu

Melody R. Lindsay[†]

Inorganic Geochemist

Deep Biosphere Laboratory

Bigelow Laboratory for Ocean Sciences

USA

mlindsay@bigelow.org

David D. McNamara[†]

Physical Properties Specialist

Department of Earth and Ocean Sciences
University of Liverpool
United Kingdom
d.mcnamara@liverpool.ac.uk

Sevasti E. Modestou[†]

Sedimentologist

Department of Earth Science
University of Bergen
Norway

Present affiliation (12 June 2023):

Department of Geography and Environmental Sciences
Northumbria University
United Kingdom
sevi.modestou@northumbria.ac.uk

Bramley Murton[†]

Petrologist

Marine Geoscience Group
National Oceanography Centre
United Kingdom
bjm@noc.ac.uk

Suzanne OConnell[†]

Sedimentologist

Department of Earth and Environmental Sciences
Wesleyan University
USA
soconnell@wesleyan.edu

Gabriel T. Pasquet[†]

Petrologist

Complex Fluids and Reservoirs Laboratory
University of Pau and the Adour Region
France
gabriel.pasquet@univ-pau.fr

Paul N. Pearson[†]

Micropaleontologist (planktonic foraminifers)

Department of Earth Sciences
University College London
United Kingdom
p.pearson@ucl.ac.uk

Sheng-Ping Qian[†]

Petrologist

School of Ocean and Earth Science
Tongji University
China
qianshengping@126.com

Expedition 395C outreach

Jose M. Cuevas

Outreach Officer

Department of Earth and Environment
Boston College
USA
cuevasjo@bc.edu

Yair Rosenthal[†]

Physical Properties Specialist/Stratigraphic Correlator

Institute of Marine and Coastal Sciences
Rutgers, The State University of New Jersey
USA
rosentha@marine.rutgers.edu

Sara Satolli[†]

Paleomagnetist

Department of Engineering and Geology
University of Chieti-Pescara
Italy
sara.satolli@unich.it

Jamie L. Shamrock[†]

Micropaleontologist (nannofossils)

Earth and Atmospheric Sciences
University of Nebraska, Lincoln
USA
s-jshamro1@unl.edu

Takuma Suzuki[†]

Micropaleontologist (planktonic foraminifers)

Department of Geoscience
Shimane University
Japan

Present affiliation (12 June 2023):

Marine Core Research Institute
Kochi University
Japan
jm-takuma_suzuki@kochi-u.ac.jp

Saalim M. Syed[†]

Sedimentologist

Antarctic Science Division
National Centre for Antarctic and Ocean Research (NCAOR)
India
saalim@ncpor.res.in

Nicholas J. White[†]

Physical Properties Specialist

Bullard Laboratories - Department of Earth Sciences
University of Cambridge
United Kingdom
njw10@cam.ac.uk

Alexandra Yang Yang[†]

Inorganic Geochemist

Guangzhou Institute of Geochemistry
Chinese Academy of Sciences
China
yangyang@gig.ac.cn

Expedition 384 scientist

Peter Blum

Expedition Project Manager/Staff Scientist

International Ocean Discovery Program

Texas A&M University

USA

blum@iodp.tamu.edu

Operational and technical staff

Siem Offshore AS officials

Expedition 395

Jake Robinson

Master of the Drilling Vessel

Mark Robinson

Drilling Supervisor

Expedition 395C

Harm Nienhuis

Master of the Drilling Vessel

Wayne Lambert

Drilling Supervisor

Expedition 384

Jake Robinson

Master of the Drilling Vessel

Mark Robinson

Drilling Supervisor

JRSO shipboard personnel and technical representatives

Expedition 395

Alejandro Avila Santis

Marine Laboratory Specialist

Tiffany Liao

Marine Laboratory Specialist

Susan Boehm

Marine Laboratory Specialist

Chang Liu

Marine Laboratory Specialist

William Dan Cary

Applications Developer

Daniel Marone

Assistant Laboratory Officer

Enrico De Pano

Marine Computer Specialist

Aaron Mechler

Marine Laboratory Specialist

David Fackler

Applications Developer

Beth Novak

Assistant Laboratory Officer

Fabricio Ferreira

Marine Laboratory Specialist

Chieh Peng

Laboratory Officer

Clayton Furman

Schlumberger Engineer

Claudio Robustelli Test

Marine Laboratory Specialist

Randy Gjesvold

Marine Instrumentation Specialist

Lars Daniel Rudback

Marine Laboratory Specialist

Kevin Grigar

Operations Superintendent

Alyssa Stephens

Publications Specialist

Mark Higley

Marine Laboratory Specialist

Steven Thomas

Marine Computer Specialist

James Kowalski

Curatorial Specialist

Garrick Van Rensburg

Marine Instrumentation Specialist

Aidan Leetz

Marine Laboratory Specialist

Expedition 395C

Tiago Biller

Marine Laboratory Specialist

Etienne Claassen

Marine Instrumentation Specialist

Lisa Crowder

Laboratory Officer

Doug Cummings

Publications Specialist

David Fackler

Marine Computer Specialist

Fabricio Ferreira

Marine Laboratory Specialist

Kevin Grigar

Operations Superintendent

Luan Heywood

Marine Laboratory Specialist

Sarah Kachovich

Marine Laboratory Specialist

Jan Jurie Kotze

Marine Instrumentation Specialist

Nick Logan

Marine Computer Specialist

Expedition 384

Gary D. Acton

Marine Laboratory Specialist

Timothy Blaisdell

Applications Developer

Susan Boehm

Marine Laboratory Specialist

Michael Cannon

Marine Computer Specialist

Lisa Crowder

Laboratory Officer

Aaron de Loach

Assistant Laboratory Officer

Randy Gjesvold

Marine Instrumentation Specialist

Sandra Herrmann

Assistant Laboratory Officer

Mark Higley

Marine Laboratory Specialist

Zenon Mateo

Assistant Laboratory Officer

Erik Moortgat

Assistant Laboratory Officer

Jenna Patten

Marine Laboratory Specialist

Vincent Percuoco

Marine Laboratory Specialist

Doris Piñero Lajas

Marine Laboratory Specialist

Alexander Roth

Marine Laboratory Specialist

Ionela Samolia

Marine Laboratory Specialist

Katy Smith

Curatorial Specialist

Johanna Suhonen

Marine Laboratory Specialist

Kerry Swain

Logging Engineer (Schlumberger)

James Zhao

Applications Developer

Minh Huynh

Marine Computer Specialist

Nicolette Lawler

Marine Laboratory Specialist

Daniel Marone

Marine Laboratory Specialist

Jenna Patten

Marine Laboratory Specialist

Bill Rhinehart

Operations Superintendent

Alexander Roth

Marine Laboratory Specialist

Mackenzie Schoemann

Marine Laboratory Specialist

Kerry Swain

Logging Engineer (Schlumberger)

IODP Publication Services staff*

Molly Blaisdell
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Parnell-Turner, R., Briais, A., and LeVay, L., 2020. Expedition 395 Scientific Prospectus: Reykjanes Mantle Convection and Climate. International Ocean Discovery Program. <https://doi.org/10.14379/iodp.sp.395.2020>

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