

Ibrahim Hoteit

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URL <http://assimilation.kaust.edu.sa/>

EDUCATION

University Joseph Fourier, Grenoble, France

Ph.D. in Applied Mathematics

2002

Dissertation: "Efficient reduced Kalman filters for data assimilation in oceanography"

University Joseph Fourier, Grenoble, France

M.Sc. in Applied Mathematics

1998

Thesis: "Optimization of observational systems"

University Joseph Fourier, Grenoble, France

B.Sc. in Mathematics

1996

Modules: Probability and Analysis

WORK EXPERIENCE

King Abdullah University of Science and Technology (KAUST), Saudi Arabia

Director Climate Change Center

2022 – present

Director Saudi Aramco Marine Environment Research Center at KAUST

2019 – present

Professor Earth Sciences and Engineering

2019 – present

Professor Applied Mathematics and Computational Sciences

Associate Director Saudi Aramco Marine Environment Research Center at KAUST

2015 – 2018

Associate Professor Earth Sciences and Engineering

2014 – 2018

Associate Professor Applied Mathematics and Computational Sciences

Assistant Professor Earth Sciences and Engineering

Assistant Professor Applied Mathematics and Computational Sciences

2009 – 2013

University of Texas at Austin, USA

Visiting Professor at the Institute of Computational Engineering and Sciences

Jan – June 2009

Scripps Institution of Oceanography (SIO), University of California, USA

Research Scientist

Ocean modeling and data assimilation

2005 – 2008

ECCO Consortium – MIT / SIO / JPL, San Diego, CA, USA

Postgraduate Researcher

Develop an eddy permitting state estimation system for the tropical Pacific

2002 – 2004

IDOPT Project – INRIA / CNRS / UJF / INPG, Grenoble, France

Research Associate

Develop reduced-order Kalman filters for ocean data assimilation

2001 – 2002

CONSULTING EXPERIENCE

<i>General Organization for Conservation of Coral Reefs and Turtles in the Red Sea, Saudi Arabia</i> Consultant on remote sensing and ocean forecasting	Oct 2023 – present
<i>Danish Hydrological Institute (DHI), Denmark</i> Consultant on Red Sea modeling and circulation	Apr 2022 – present
<i>ENOWA, NEOM, Saudi Arabia</i> Consultant on renewable energy and environment of the Red Sea	Jan 2022 – present
<i>Beacon Development – KAUST Industrial Park</i> Consultant on Red Sea environment	Jul 2017 – present
<i>MFSTEP Project – Joint project between several European institutes</i> Consultant on data assimilation into coupled physical-biogeochemical models	2001 – 2005

TEACHING EXPERIENCE

<i>King Abdullah University of Science and Technology (KAUST), Saudi Arabia</i> – “Data Assimilation in Geosciences” – “Inverse Problems” – “Data Analysis in Geosciences” M. Sc. Earth Sciences and Engineering – “Applied Mathematics” M.Sc. Applied Mathematics and Computational Sciences	2012 – present 2009 – present 2009 – present Fall 2009
<i>University Joseph Fourier, Grenoble, France</i> Lecturer & Lecturer Assistant – “Analysis & Probability” Freshmen & Sophomore in Applied Mathematics	1998 – 2001
<i>University Joseph Fourier, Grenoble, France</i> Lecturer – “Statistics and Probability” Freshmen in Biology	2000
<i>University Pierre Mendès France, Grenoble, France</i> Lecturer Assistant – “Statistics and Probability” Sophomore in Human and Social Sciences	1997
<i>Lycée Champollion, Grenoble, France</i> Oral examiner – “Analysis, Algebra & Probability” Two-year preparation for the French engineering schools “Grandes Ecoles”	1998 – 2001

RESEARCH PROJECTS

- *Minimizing Climate impact of Saudi Arabian port routes and grid-to-propeller solutions.* M. Sarathy (PI) and **I. Hoteit** (co-PI), Apr 2024 – Mar 2025 (Total budget \$240K, Personal share \$60K).
- *Harnessing coral connectivity for an effective management and enhancement of Red Sea coral reefs in Saudi Arabia.* NEOM Ocean Science and Solutions Applied Research Institute (OSSARI), F. Benzoni (PI) and **I. Hoteit** (co-PI), Feb 2024 – Jan 2026 (Total budget \$920K, Personal share \$80K).
- *NEOM emerging offshore energy technologies.* NEOM-ENOWA Energy Sector, **I. Hoteit** (PI), Nov 2023 – Jun 2024 (Total budget \$180K).

- *KAUST data use and dashboard*. NEOM-ENOWA Energy Sector, **I. Hoteit** (PI), Nov 2023 – Oct 2025 (Total budget \$1.05million).
- *CO2 emissions and variability over NEOM*. NEOM-ENOWA Energy Sector, **I. Hoteit** (PI), Nov 2022 – Oct 2024 (Total budget \$315K).
- *NEOM E&W: Design envelope for desalination plan*. NEOM-ENOWA Energy Sector, **I. Hoteit** (PI), Nov – Dec 2023 (Total budget \$40K).
- *Analysis of weather variability, weather extremes, and demand in support of ENOWA's power generation sector*. NEOM-ENOWA Energy Sector, Omar Knio (PI) and **I. Hoteit** (co-PI), Nov 2023 – Oct 2026 (Total budget \$950K, Personal share \$576K).
- *Unraveling the deep overturning circulation of the Red Sea*. Opportunity Fund Program (OFF), **I. Hoteit** (PI), Jan 2024 – Dec 2025 (Total budget \$200K).
- *NEOM Climate Change Program Phase-II: Marine ecological climate risk and resilience for the NEOM region and wider Red Sea*. NEOM Environment Sector, **I. Hoteit** (PI) and W. Le Quesne (co-PI, CEFAS, UK), Nov 2023 – Oct 2025 (Total budget \$1.06million, Personal share \$260K).
- *Modelling the Red Sea biogeochemistry with applications to seascape genetics*. NEOM Ocean Science and Solutions Applied Research Institute (OSSARI), **I. Hoteit** (PI), Aug 2023 – Jul 2024 (Total budget \$123K).
- *Urban impact of the new great Lake in Riyadh on the surrounding area*. Public Investment Fund, **I. Hoteit** (PI), May – Jun 2023 (Total budget \$60K).
- *NEOM Climate Change Program Phase-I: Atmospheric and ocean modeling under climate change for the NEOM region*. NEOM Environment Sector, **I. Hoteit** (PI), May 2023 – Apr 2025 (Total budget \$3.13million, Personal share \$1.6million).
- *Investigating rainfall variability and IDF curves over NEOM*. NEOM-ENOWA, **I. Hoteit** (PI), Feb 2023 – Jun 2023 (Total budget \$93K).
- *Ultra-high resolution urban weather and climate modeling of KAUST*. KAUST Climate and Livability Initiative, **I. Hoteit** (PI), Jan 2023 – Dec 2023 (Total budget \$100K).
- *Real time monitoring and forecasting oil spill around Aramco facilities in the Arabian Gulf*. ARAMCO, **I. Hoteit** (PI), Dec 2022 – Nov 2025 (Total budget \$1.225million).
- *Developing a 20-year reanalysis for the Arabian for the Arabian Gulf*. ARAMCO, **I. Hoteit** (PI), Dec 2022 – Nov 2025 (Total budget \$527K).
- *Sea level rise and extremes in the Red Sea and Arabian Gulf*, ARAMCO, **I. Hoteit** (PI), Dec 2022 – Nov 2025 (Total budget \$322K).
- *A tidal elevation prediction system for the Arabian Gulf and the Red Sea*. ARAMCO, **I. Hoteit** (PI), Dec 2022 – Nov 2023 (Total budget \$127K).
- *Estimation of emission, spread and evolution of CO2 across NEOM region using computational models and satellite measurements*. NEOM Energy Sector, **I. Hoteit** (PI), Oct 2022 – Sep 2024 (Total budget \$350K).
- *Climate Change Center*. Saudi Ministry of Environment, Water and Agriculture (MEWA), **I. Hoteit** (PI), Sep 2022 – Dec 2025 (Total budget \$17.8million).
- *AI-enhanced operational short-term energy predictions at NEOM*. Center Partnership Funding – Extreme Computing Research Center, **I. Hoteit** (PI) and O. Knio (co-PI), May 2022 – Apr 2024 (Total Budget \$440K).
- *Dispersion modelling for the new NEOM selective desalination plant*. NEOM Water Sector, **I. Hoteit** (PI), July 2022 – December 2022 (Total budget \$90K).
- *Virtual Red Sea Initiative*. KAUST Strategic Initiative Program, **I. Hoteit** (PI) and O. Knio (KAUST, co-PI), and external collaborators B. Cornuelle (Scripps Institution of Oceanography, co-PI), J. Anderson

(NCAR, co-PI) and D. Raitsos (University of Athens, co-PI), July 2021 – Jun 2024 (Total budget \$1.5million, Personal share \$600K).

- *Weather informed profiling for solar and wind energy harvesting across NEOM*. NEOM Energy Sector, **I. Hoteit** (PI), February 2022 – Jan 2024 (Total budget \$170K).
- *A software framework for optimal investment and operation of power plants*. KAUST Research Translation Funding Program, O. Knio (KAUST, PI) and **I. Hoteit** (co-PI), Jan 2022 – Dec 2023 (Total budget \$931K, Personal share \$160K).
- *Arabian Peninsula's land-based and marine heatwaves: Variability, drivers, trends, and predictability up to sub-seasonal scales*. KAUST Competitive Research Grants Program, **I. Hoteit** (PI), A. Subramanian and D. Giglio (University of Colorado, co-PIs), Apr 2022 – Mar 2025 (Total budget \$940K, Personal share \$600K).
- *Optimizing buildings hybrid renewable energy systems under weather and climate variability*. KAUST Climate and Livability Initiative, O. Knio (KAUST, PI) and **I. Hoteit** (co-PI), Nov 2021 – Oct 2022 (Total budget \$100K, Personal share \$40K).
- *KMET: KAUST Meteorology*. KAUST Climate and Livability Initiative, K. Salama (KAUST, PI) and **I. Hoteit** (co-PI), Nov 2021 – Oct 2023 (Total budget \$200K, Personal share \$75K).
- *Using machine learning to compress scientific data*. KAUST AI initiative, P. Kalnis (KAUST, PI) and **I. Hoteit** (co-PI), July 2021 – Jun 2022 (Total budget \$100K, Personal share \$80K).
- *Remote sensing mangroves in the Red Sea and their variability in relation to environmental conditions*. KAUST Circular Carbon Initiative, M. McCabe (KAUST, PI) and **I. Hoteit** (co-PI), July 2021 – Jun 2022 (Total budget \$150K, Personal share \$50K).
- *Hydrodynamics in a large Red Sea carbonate platform lagoon and its impact on benthic and planktonic biota and sediment distribution – Al Wajh, KSA project*. KAUST Center Competitive Funding – Red Sea Research Center, Volker C. Vahrenkamp (KAUST, PI), Carlos Santamarina (KAUST, PI) and **I. Hoteit** (co-PI), July 2021 – Jun 2022 (Total budget \$155K, Personal share \$70K).
- *Subseasonal through interannual variability of river discharge and its impact on phytoplankton biomass in the Bay of Bengal*. Institutes of Eminence (IoE), India, A. Karumuri (PI, University of Hyderabad, India), **I. Hoteit** (co-PI), Jan 2021 – Dec 2024 (Total budget \$95K, Personal share \$15K).
- *AI-aided probabilistic reservoir characterization using ensemble history matching with big data*. ARAMCO, **I. Hoteit** (PI), Nov 2020 – Oct 2023 (\$516K).
- *An intelligent early-warning oil spill detection and prediction system for the Arabian Gulf and the Red Sea*. ARAMCO, **I. Hoteit** (PI), Nov 2020 – Oct 2023 (\$490K).
- *An efficient framework for downscaling large ensemble forecasts with application to geophysical flows*. KAUST Competitive Research Grants Program, O. Knio (KAUST, PI), **I. Hoteit** (co-PI) and E. Titi (Cambridge University, co-PI), Apr 2021 – Mar 2024 (Total budget \$1.05million, Personal share \$225K).
- *Developing operational ocean-atmosphere-wave forecasting systems for the Red Sea and Arabian Gulf*. ARAMCO, **I. Hoteit** (PI), Feb 2020 – Jan 2023 (\$2.7million).
- *A managing environment for sustainability hub*. Center of Excellence for NEOM Research at KAUST, **I. Hoteit** (PI), C. Pain (Imperial College, co-PI), R. Ranasinghe (IHE-Delft, co-PI) and S. Groom (Plymouth Marine Laboratory – PML, co-PI), Oct 2019 – Sep 2021 (Total budget \$1.1million, Personal share \$390K).
- *Arabian Peninsula precipitation variability, extremes, trends, and ultra-fine predictability up to sub-seasonal scales*. KAUST Competitive Research Grants Program, **I. Hoteit** (PI) and C. Castro (University of Arizona, co-PI), Apr 2019 – Mar 2022 (Total budget \$850K, Personal share \$510K).
- *Detecting, tracking, and forecasting of hazardous spills in the Red Sea*. KAUST Competitive Research Grants Program, O. Knio (KAUST, PI), **I. Hoteit** (co-PI) and C. Dawson (UT-Austin, co-PI), Apr 2019 – Mar 2022 (Total budget \$1million, Personal share \$200K).

- *MPA design in the Red Sea*. KAUST Center Competitive Funding – Red Sea Research Center, Michael Berumen (KAUST, PI) and **I. Hoteit** (co-PI), July 2019 – Jun 2020 (Total budget \$450K, Personal share \$50K).
- *Developing pre-operational ocean-atmosphere-wave forecasting systems for the Red Sea and Arabian Gulf*. ARAMCO, **I. Hoteit** (PI), Dec 2018 – Nov 2019 (\$440K).
- *Nested high-resolution modeling of the coastal Red Sea*. KAUST Center Competitive Funding – Red Sea Research Center, **I. Hoteit** (PI), July 2018, Jun 2019 (\$65K).
- *Control of the Red Sea circulation and stratification by strait hydraulics and internal waves on multiple time scales*. KAUST Competitive Research Grants Program, **I. Hoteit** (PI), L. Pratt (Woods Hole Oceanographic Institution, co-PI) and T. Akylas (MIT, co-PI), Apr 2018 – Mar 2021 (Total budget \$835K, Personal share \$500K).
- *A new paradigm in precision agriculture: assimilation of ultra-fine resolution data into a crop-yield forecasting model*. KAUST Competitive Research Grants Program, M. McCabe (KAUST, PI), **I. Hoteit** (co-PI) and J. Sheffield (University of Southampton, co-PI), Apr 2018 – Mar 2021 (Total budget \$1.05million, Personal share \$225K).
- *Wave and storm surge assessment under climate change scenarios at King Abdullah Economic City (KAEC)*. KAEC funded project, **I. Hoteit** (PI) and O. Knio (KAUST, co-PI), Dec 2017 – Feb 2018 (\$85K).
- *Remote sensing harmful algal blooms in the Red Sea*. KAUST Center Competitive Funding – Red Sea Research Center, **I. Hoteit** (PI), July 2017 – Jun 2018 (\$50K).
- *Environmental impact assessment of the Red Sea and NEOM projects*. Saudi Public Investment Fund, Abdulaziz Al-Suwailem (Beacon Development Company, PI) and **I. Hoteit** (co-PI), Jul 2017 – Jun 2019 (Personal share \$600K).
- *Virtual Red Sea Initiative*. KAUST Strategic Initiative Program, **I. Hoteit** (PI) and O. Knio (KAUST, co-PI), and external collaborators B. Cornuelle and A. Miller (Scripps Institution of Oceanography, co-PI), T. Platt (Plymouth Marine Laboratory, co-PI) and P. Lermusiaux (MIT, co-PI), May 2017 – Apr 2020 (Total budget \$1.8million, Personal share \$750K).
- *Efficient integration of electromagnetic tomography into reservoir history matching*. ARAMCO, **I. Hoteit** (PI), Apr 2017 – Mar 2020 (\$450K).
- *Ventilation of the deep Red Sea: Formation processes, deep circulation and their variability*. KAUST Competitive Research Grants Program, **I. Hoteit** (PI) and M. Hendershott (Scripps Institution of Oceanography, co-PI), Apr 2017 – Mar 2019 (Total budget \$400K, Personal share \$240K).
- *Wave and tide assessment at King Abdullah Economic City (KAEC)*. KAEC funded project, **I. Hoteit** (PI) and O. Knio (KAUST, co-PI), Dec 2016 – Feb 2017 (\$60K).
- *Dynamically adaptive data-driven simulation and uncertainty quantification of coastal flows*. KAUST Competitive Research Grants Program, **I. Hoteit** (PI) and C. Dawson (UT-Austin, co-PI), March 2015 – Feb 2018 (Total budget \$900K, Personal share \$570K).
- *High resolution modeling and forecasting of Doha circulation*. CGG – Geoscience company, **I. Hoteit** (PI), October 2015 – Dec 2015 (\$55K).
- *Modeling dispersion of suspended sediments and dissolved contaminants in the Red Sea*. Red Sea Research Center Competitive Funding Program, **I. Hoteit** (PI) and O. Knio (KAUST, co-PI). July 2014 – Jun 2017 (Personal share \$380K).
- *Modeling and forecasting the Red Sea circulation*. ARAMCO, **I. Hoteit** (PI), August 2013 – July 2018 (Personal share \$1.2million).
- *Spatio-temporal models for extreme values: an application to sea surface temperatures in the Red Sea*. TAMU-IAMCS Innovation Award, **I. Hoteit** (PI) and H. Sang (TAMU, co-PI), Jun 2013 – May 2015 (Total Budget \$40K, Personal Share \$15K).

- *Optimization and uncertainty quantification of ocean boundary layers physics*. KAUST Competitive Research Grants Program, **I. Hoteit** (PI) and Charles Jackson (UT-Austin, co-PI), Aug 2012 – Jul 2015 (Total budget \$650K, Personal share \$430K).
- *Modeling and studying the circulation in the Red Sea*. Collaborative Fellow KAUST-WHOI Program, **I. Hoteit** (PI), L. Pratt and A. Bower (WHOI, co-PIs), Mar 2012 – Feb 2015 (Personal share \$160K).
- *Schlumberger software and training donation to support research in reservoir history matching at KAUST*. **I. Hoteit** (PI), Jan 2012 – Dec 2014 (Total donation \$4million).
- *Nonlinear Bayesian filtering with large scale geophysical systems: Beating the curse of dimensionality*. Collaborative Fellow KAUST/Oxford (OCCAM) Program, **I. Hoteit** (PI) and C. Farmer and I. Moroz (University of Oxford, co-PIs), Jun 2012 – Dec 2014 (Personal share \$140K).
- *Simulation of subsurface geochemical transport and carbon sequestration*. Academic Excellent Alliance KAUST/UT-Austin Program, S. Sun (KAUST, PI), **I. Hoteit** (co-PI) and M. Wheeler (UT-Austin, co-PI), Sep 2012 – Aug 2015 (Total budget \$3millions, Personal share \$450K).
- *State-parameter estimation and uncertainty quantification for advanced predictive models of extreme events in the coastal ocean*. Academic Excellent Alliance KAUST/UT-Austin Program, **I. Hoteit** (PI) and C. Dawson (UT-Austin, co-PI), Jul 2011 – Jun 2014 (Total budget \$520K, Personal share \$370K).
- *A unified Bayesian framework for inverse and data assimilation problems with applications in Oceanography*. Collaborative Fellow KAUST/TAMU Program, **I. Hoteit** (PI) and B. Mallick (TAMU, PI), Jun 2012 – May 2015 (Personal share \$160K).
- *Data assimilation for management of industrial groundwater contamination at a regional scale*. Collaborative Fellow KAUST/SOWACOR Program, **I. Hoteit** (PI), S. Sun (KAUST, co-PI) and J. Valstar (Deltares, co-PI), Jan 2011 – Dec 2013 (Personal share \$140K).
- *Atmospheric modeling and data Assimilation for the Red Sea region*. SABIC postdoctoral fellow, G. Stenchikov (KAUST, PI) and **I. Hoteit** (co-PI), July 2011 – Jun 2012 (\$80K).
- *Uncertainty quantification and estimation of ocean model mixing parameters in the tropical Pacific*. Academic Excellent Alliance KAUST/UT-Austin grant, **I. Hoteit** (PI) and C. Jackson (UT-Austin co-PI), Jul 2010 – Jun 2012 (Total budget \$600K, Personal share \$240K).
- *Analyzing and predicting the circulation of the Red Sea*. Red Sea Research Center, **I. Hoteit** (PI). Jan 2010 – Dec 2010 (Total budget \$100K).
- *Storm surge forecasting using nonlinear filtering*. Academic Excellent Alliance KAUST/UT-Austin Program, **I. Hoteit** (PI) and C. Dawson (UT-Austin, co-PI), Jul 2010 – Jun 2011 (Total budget \$200K, Personal share \$80K).
- *A feasibility study on modeling the physics and the ecosystem of the Red Sea*. KAUST Collaboration Travel Funds, **I. Hoteit** (PI), 2009 (Personal share \$16K).
- *Particle Kalman filtering for data assimilation in oceanography*. Office of Naval Research, **I. Hoteit** (Scripps Institution of Oceanography, PI), May 2008 – April 2009 (Personal share \$120K).
- *Combining acoustic, in-situ, and remotely sensed data with regional ocean models in the east China and Philippine Seas*. ONR, B. Cornuelle (Scripps Institution of Oceanography, PI) and **I. Hoteit** (Scripps Institution of Oceanography, co-PI), Nov 2008 – Oct 2009 (Personal share \$100K).
- *Predicting the evolution of the loop current in the Gulf of Mexico*. British Petroleum - BP, B. Cornuelle (Scripps Institution of Oceanography, PI) and **I. Hoteit** (Scripps Institution of Oceanography, co-PI), Nov 2007 – Oct 2009 (Personal share \$160K).
- *Data assimilation into coupled 3D marine ecosystem model of the Mediterranean Sea*. EU project, **I. Hoteit** (Consultancy contract), 2002 – 2005 (Personal share \$35K).

Ph.D. STUDENTS / M.Sc. STUDENTS / ALUMNI / VISITING STUDENTS

PH.D. STUDENTS (Current 10)

- Nikolaos Papagiannopoulos, Marine Sciences and Engineering, KAUST, Sep 2019 – present
Remote sensing NEOM marine environment
- Abdulilah Alduwais, Earth Sciences and Engineering, KAUST, Sep 2019 – present
Remote sensing and modeling air pollution
- Jason Theodorou, Marine Biology, University of Athens, co-advisor, Nov 2020 – present
Impact of extreme heat and cold events on ocean productivity
- Elissar Al-Aawar, Earth Sciences and Engineering, KAUST, Aug 2021 – present
Urban scale modeling and Bayesian inference of air pollution
- Marianthi Pateraki, Earth Sciences and Engineering, KAUST, Aug 2021 – present
Physics-biology interactions in the Red Sea
- Salma Alsinan, Earth Sciences and Engineering, KAUST, Dec 2021 – present
AI-aided reservoir characterization
- Juan Mendez Espinosa, Earth Sciences and Engineering, KAUST, Jan 2023 – present
Air Pollution and transport over the Arabian Peninsula
- Rihab Larayedh, Applied Applied Mathematics and Computational Science, KAUST, Jul 2023 – present
Risk associated with shipping and their optimal routes in the Red Sea
- Paschalis Garouniatis, Earth Sciences and Engineering, KAUST, Feb 2024 – present
Circulation, dynamics and climate of the Arabian Gulf
- Sofien Resifi, Earth Sciences and Engineering, KAUST, Jul 2024 – present
AI for weather and climate downscaling and predictions

M.Sc. STUDENTS (Current 1)

- Cristhian Valladares, Earth Science and Engineering, KAUST, Sep 2023 – present
Waves modeling, dynamics and projections in the Red Sea

ALUMNI (21 Ph.D., 18 M.Sc.)

- Jingyi Ma, Ph.D. Earth Sciences and Engineering, KAUST, Sep 2018 – Oct 2024
Internal tides in the Arabian Sea
Postdoc, Organization for Conservation of Coral Reefs and Turtles in the Red Sea - SHAMS, KAUST, KSA
- Elamurugu Gokul, Ph.D. Earth Sciences and Engineering, KAUST, Sep 2018 – Aug 2024
Monitoring and studying the spatiotemporal variability of harmful algal blooms and coral bleaching in the Red Sea using satellite remote sensing
Postdoc, Organization for Conservation of Coral Reefs and Turtles in the Red Sea - SHAMS, KAUST, KSA
- Panagiotis Vasou, Ph.D. Earth Sciences and Engineering, KAUST, Sep 2018 – Aug 2024
Exchanges through the strait of Hormuz and their impact on the Arabian Gulf's thermohaline variability
Postdoc, Saudi Aramco Marine Environment Research Center at KAUST, KAUST, KSA
- Mohammad Hammoud, co-adviser Prof. O. Knio, Ph.D. Mechanical Engineer, Nov 2020 – April 2024
Artificial intelligence for downscaling and data assimilation: Application to uncertain chaotic systems
Postdoc, Princeton University, New Jersey, USA
- Yixin Wang, Ph.D. Marine Sciences, KAUST, Sep 2018 – Dec 2023
Modelling the physical connectivity and marine ecosystem of the Red Sea with application to seascape genetics
Postdoc, NEOM-KAUST Institute for Ocean Science and Solutions, KAUST, KSA
- Lily Genevier, Ph.D. Marine Sciences, KAUST, Sep 2018 – Dec 2023
Coral Bleaching and its Links to Marine Heatwaves and Extreme Environmental Events
Postdoc, Saudi Aramco Marine Environment Research Center at KAUST, KAUST, KSA
- Samah El-Mohtar, Ph.D. Earth Sciences and Engineering, KAUST, Dec 2017 – Oct 2023
Uncertainty quantification in forward and inverse oil spill problems with application to the Red Sea

Postdoc, Saudi Aramco Marine Environment Research Center at KAUST, KAUST, KSA

- Naila Raboudi, Ph.D. Earth Sciences and Engineering, KAUST, Jan 2017 – Sep 2022
Ensemble Kalman filtering with one-step-ahead smoothing: Application to challenging ocean data assimilation problems
Postdoc, Saudi Aramco Marine Environment Research Center at KAUST, KAUST, KSA
- Matteo Ziliani, co-adviser Prof. M. McCabe, Ph.D. Environmental Sciences and Engineering, KAUST, Sep 2016 – Jan 2022
Predicting crop yield Using crop models and high-resolution remote sensing technologies
Data Scientist at HYDROSAT, Luxembourg
- George Krokos, Ph.D. Earth Sciences and Engineering, KAUST, Jan 2015 – July 2021
Development of the oceanic mixed layers and the processes governing the evolution of their properties in the Red Sea
Research Scientist, Hellenic Center of Marine Research, Greece
- John Gittings, Ph.D. Marine Sciences and Engineering, KAUST, Dec 2016 – Nov 2020
A contemporary investigation on phytoplankton ecological indicators in the Red Sea
Postdoc Living Planet Fellowship from the European Space Agency (ESA), University of Athens, Greece
- Habib Toye, Ph.D. Applied Mathematics & Computational Sciences, KAUST, Aug 2014 – October 2020
Efficient ensemble data assimilation and forecasting of the Red Sea circulation
- Daquan Guo, Ph.D. Earth Sciences and Engineering, KAUST, Sep 2013 – Apr 2019
Numerical investigation of baroclinic tides in the Red Sea
Postdoc, Red Sea Research Center, KAUST, KSA
- Adil Siripatana, Ph.D. Earth Sciences and Engineering, KAUST, Sep 2014 – Apr 2019.
Uncertainty quantification and assimilation for efficient coastal ocean forecasting
Postdoc, University of New South Wales, Sydney, Australia
- Peng Zhan, Ph.D. Earth Sciences and Engineering, KAUST, Sep 2013 – April 2018
Properties, mechanisms, and predictability of the Red Sea eddies
Research Scientist, Saudi ARAMCO-KAUST Marine Environmental Observatory, KSA
- Denis Dreano, Ph.D. Applied Mathematics & Computational Sciences, KAUST, Jan 2012 – April 2017
Data and dynamics driven approaches for modeling and forecasting the Red Sea Chlorophyll
Junior Manager, Suisse Re, Switzerland
- Sabique Langodan, Ph.D. Earth Sciences and Engineering, KAUST, Jan 2012 – Nov 2016
The Red Sea: An arena for wind-wave modeling in enclosed seas
Research Scientist, Saudi ARAMCO-KAUST Marine Environment Research Center, KSA
- Furrukh Sana (co Prof. Tariq Al-Nafouri), Ph.D. Electrical Engineering, KAUST, Jan 2012 – Nov 2016
Efficient techniques of sparse signal analysis for enhanced recovery of Information in biomedical engineering and geosciences
Research Fellow, Massachusetts General Hospital, Boston, USA
- Ali Al-Dawood, Ph.D. Earth Sciences and Engineering, KAUST, Aug 2012 – Aug 2016
Linearized inversion frameworks toward high-resolution seismic imaging
Geophysist II, Saudi ARAMCO, KSA
- Klemens Katterbauer, Ph.D. Earth Sciences and Engineering, KAUST, Jan 2012 – Mar 2015
Multidata reservoir history matching and uncertainty quantification
Research Engineer, RESOPTIMA, Oslo, Norway
- Mohamad El Gharamati, Ph.D. Earth Sciences and Engineering, KAUST, Jan 2011 – Nov 2014
Data assimilation for management of industrial groundwater contamination on a regional scale
Scientist-I (tenured position), National Center of Atmospheric Research (NCAR), Boulder, CO, USA
- Sofien Resifi, M.Sc. Earth Science and Engineering, KAUST, Aug 2022 – Jun 2024
Mapping and predicting renewable energy using AI

PhD Student, Earth Sciences and Engineering, KAUST, KSA

- Rihab Larayedh, Applied Mathematics and Computational Science, KAUST, Aug 2021 – Jun 2023
Distribution and variability of underwater noise from the main shipping line in the Red Sea
PhD Student, Applied Mathematics and Computational Science, KAUST, KSA
- Ana Carrasco, M.Sc. Mechanical Engineering, KAUST, Nov 2020 – Jun 2021
Risk assessment of oil spills in the NEOM region using Lagrangian particle tracking simulations
PhD Student, Mechanical Engineering, KAUST, KSA
- Mohammad Abed Al-Rahman Hammoud, M.Sc. Mechanical Engineering, KAUST, Jun 2019 – Mar 2020
Moving source identification in an uncertain marine flow: Application to the Mediterranean Sea
PhD Student, Mechanical Engineering, KAUST, KSA
- Yixin Wang, M.Sc. Marine Sciences and Engineering, KAUST Sep 2017 – May 2018
Simulating coral reef connectivity in the Southern Red Sea
PhD Student, Marine Sciences and Engineering, KAUST, KSA
- Naila Raboudi, M.Sc. Earth Sciences and Engineering, KAUST, Jan 2016 – Nov 2016
An ensemble Kalman filter with one-step-ahead smoothing for storm surge forecasting
PhD Student, Earth Sciences and Engineering, KAUST, KSA
- John Gittings, M.Sc. Marine Sciences and Engineering, KAUST, May 2016 – Nov 2016
Climate warming and interannual variability of phytoplankton phenology in the Northern Red Sea
PhD Student, Marine Sciences and Engineering, KAUST, KSA
- Hassan Ismail, M.Sc. Earth Sciences and Engineering, KAUST, Feb 2014 – Jun 2014
Seismic forward and compressed sensing inverse simulations
Research Engineer, ARAMCO, KSA
- Santiago Arango, M.Sc. Earth Sciences and Engineering, KAUST, Mar 2014 – Sep 2014
Ensemble history matching with Eclipse
Research Engineer, ARAMCO, KSA
- Adil Siripatana, M.Sc. Earth Sciences and Engineering, KAUST, Jan 2014 – Jun 2018
Uncertainty quantification and assimilation for efficient coastal ocean forecasting
PhD Student, Earth Sciences and Engineering, KAUST, KSA
- Eyas Al-Fares, M.Sc. Applied Mathematics and Computational Sciences, KAUST, Aug 2012 – July 2013
Ensemble Kalman Filtering for traffic state-parameter estimation and prediction
Research Engineer, KACST, KSA
- Peng Zhan, M.Sc. Earth Sciences and Engineering, KAUST, Aug 2012 – May 2013
Sea surface height variability and eddies statistical properties in the Red Sea
PhD Student, Earth Sciences and Engineering, KAUST, KSA
- Fabio Ravanelli, M.Sc. Earth Sciences and Engineering, KAUST, Aug 2012 – May 2013
Reservoir history matching of 4D seismic attributes with the Ensemble Kalman filter
ARAMCO, Research Engineer, KSA
- Xing Yi, M.Sc. Earth Sciences and Engineering, KAUST, May 2012 – Dec 2012
Ocean color trend analysis in the Red Sea
PhD Student, University of Hamburg, Germany
- Bashair Aman, M.Sc. Applied Mathematics and Computational Sciences, KAUST, Feb 2012 – Nov 2012
Reservoir history matching using ensemble Kalman filters with anamorphosis transforms
ARAMCO, Research Engineer, KSA
- Zaid Sawlan, M.Sc. Applied Mathematics and Computational Sciences, KAUST, Feb 2012 – Nov 2012
Ensemble Kalman filtering and smoothing for tsunami prediction and parameters estimation
PhD Student, Applied Mathematics and Computational Sciences, KAUST, KSA
- Lautaro Rayo, M.Sc. Earth Sciences and Engineering, KAUST, Sep 2011 – Sep 2012
Ensemble Kalman filtering for reservoir history matching with Eclipse

ARAMCO, Research Engineer, KSA

- Mohamad El Gharamati, M.Sc. Earth Sciences and Engineering, KAUST, Feb 2010 – Dec 2010
Application of low-rank Kalman filtering to subsurface contaminant transport models
PhD Student, Earth Sciences and Engineering, KAUST, KSA
- Hajoon Song & Aneesh Subramanian, Ph.D. UCSD (Advisee), CA, USA, 2007 – 2009
Data assimilation and nonlinear ensemble Kalman filtering

VISITING STUDENTS

- Pubali Mukherjee, Ph.D. IIT Mumbai, Mumbai, India, Sep 2023 – Dec 2024
Remote sensing sediments in the Red Sea
- Athira Nambeesan, Ph.D. Cochin University of Science and Technology, Cochin, India, Sep 2023 – Jan 2024
Air-sea interaction in the Red Sea and moisture transport
- Manal Alawadi, Ph.D. University of Liege, Belgium, Jan 2023 – Jun 2023
Marine heat waves dynamics in the Red Sea
- Dong Jian, M.Sc. Ocean Sciences, Hamburg University, Germany, Jan 2023 – Jun 2023
Adjoint sensitivity of deep and intermediate water formation events in the northern Red Sea
- Sofien Resifi, B.S. Tunis Polytechnic School, Tunisia, Jan 2022 – Jun 2022
Spatial prediction of solar energy resources in NEOM using Machine Learning and atmospheric conditions
- Rihab Larayedh, B.S. Tunis Polytechnic School, Tunisia, Jan 2021 – Jun 2021
Distribution and variability of transportation underwater noise in the Red Sea
- Akurathi V.S. Chaitanya, Ph.D. Ocean Sciences, Bharathidasan University, India, Jan 2021 – Jun 2021
Impact of river discharges on the interannual variability of the Arabian Gulf general circulation
- Divya C.V., M.Sc. Computer Science, The University of Texas at Dallas, USA, July 2020 – Dec 2020
Forecasting solar energy in NEOM using machine learning and atmospheric conditions
- Biyo Thomas, M.Sc. Atmospheric and Marine Sciences, Cochin University, India, July 2020 – Dec 2020
Wind breeze along the Red Sea coast
- Misaa AlKhayyat, M.Sc. Mechanical Engineering, Effat University, Saudi Arabia, Dec 2019 – Mar 2020
Assessing wave energy potential in NEOM
- Koteswararao Vankaylapati, Ph.D. Atmospheric Sciences, Andhra University, India, Feb 2020 – Jun 2020
Oil spill remote sensing in the Red Sea
- Elissar El-Aawar, M.Sc. Mechanical Engineering, American University, Lebanon, Feb 2020 – Jun 2020
Multi-scale modeling of KAUST urban air pollution
- Raju Pathak, Ph.D. Atmospheric and Climate Sciences, IIT Delhi, India, Nov 2019 – Apr 2020
Uncertainty quantification of cloud parameterization in climate modeling
- Ruchi Parihar, Ph.D. Atmospheric and Climate Sciences, IIT Delhi, India, Jul 2019 – Sep 2019
Impact of regional climate on health-related issues in the Arabian Peninsula
- Popat Salunke, Ph.D. Atmospheric and Climate Sciences, IIT Delhi, India, Jul 2019 – Sep 2019
Assessing climate projections over the Arabian Peninsula
- Rama Krishna, Ph.D. Atmospheric and Climate Sciences, Indian Institute of Tropical Meteorology, India, May 2019 – Oct 2019
Dust simulation and variability over the Arabian Peninsula using WRF-Chem
- Boyaj Alugula, Ph.D. in Atmospheric Sciences, University of Hyderabad, India, May 2019 – Oct 2019
Assimilating moisture data to improve rainfall prediction with WRF
- Nikolaos Papagiannopoulos, M.Sc. in Marine Biology, Lund University, Sweden, Feb 2019 – Jun 2019
Chlorophyll variability along the NEOM coast
- Josua Shilling, M.Sc. Mathematical Science, University College Dublin, Ireland, Nov 2018 – Apr 2019

Ensembles validation of an ocean EnKF data assimilation system

- Shanas Razak, Ph.D. Marine Sciences, King Abdulaziz University (KAU), Jeddah, KSA, Feb – Dec 2018
Effect of coupling wave-tide-circulation on the coastal modeling of the Red Sea
- Abdulla Poyil, Ph.D. Marine Sciences, King Abdulaziz University (KAU), Jeddah, KSA, Feb – Oct 2018
Interannual variability of Gulf of Aden intermediate water summer intrusion into the Red Sea
- Lily Genevier, M.Sc. Applied Marine Science, Plymouth University, Plymouth, UK, Feb – Jun 2018
Seasonal and interannual variability of marine heat waves
- Charls Antony, Ph.D. Marine Science, Goa University, Goa, India, Nov – Apr 2018
Storm surge risk maps for the Red Sea
- Elamurugu Gokul, M.S. of Science, IIT Madras, Madras, India, Aug – Dec 2017
Remote sensing harmful Algae blooms in the Red Sea
- Mohammad Abed Al-Rahman Hammoud, B.S. Mechanical Engineering, American University of Beirut (AUB), Beirut, Lebanon, May – August 2017
Assessing a variational-Bayesian ensemble Kalman filter
- Ziad Kobeissi, M.Sc. Mathematics, Ecole Normale Supérieure – Lyon, France, May – Jun 2016
Data assimilation with transport maps
- Peng Zhang, B.S. Oceanography, Ocean University of China, Qingdao, China, Feb – May 2016
Simulation of internal solitary waves with a nonhydrostatic MITgcm
- Matteo Ziliani, M.Sc. Environmental Engineering, Politecnico Di Milano, Italy, Sep – Jan 2016
Data assimilation and prediction of city flooding
- Lixi Zhao, M.Sc. Civil and Environmental Engineering, Georgia Tech, USA, Apr – Aug 2015
Continuous data assimilation for downscaling
- Jun Nie, M.Sc. Mechanical Engineering, Xi'an Jiaotong University, China, Sep 2014 – Jan 2015
Uncertainty quantification of a debris models
- Feifei Liu, Ph.D. Earth Sciences University of Hamburg, Germany, Sep 2014 – Jan 2015
Uncertainty quantification of a marine ecosystem model of the China Sea
- Muaamar Al-Shedivat, B.S. Lomonosov Moscow State University, Russia, Feb – Jun 2014
Continuous data assimilation vs. spectral nudging with the Bernard convection model
- Naila Raboudi, B.S. Tunis Polytechnic School, Tunisia, Feb – Jun 2014
Hybrid vs. adaptive ensemble Kalman filtering for storm surge forecasting
- Benjamin Wagman, M.Sc. UT-Austin, USA, Aug – Sep 2013
Uncertainty quantification of ocean boundary layers in the tropical Pacific
- Aurore Boutin, M.Sc. ENSTA, France, Apr – Aug 2012
Storm surge forecasting in the Gulf of Mexico using ensemble Kalman filters
- Sergey Charny, M.Sc. European University of Budapest, Russia, Apr – Aug 2012
Computing climate adjoint sensitivities in chaotic systems

RESEARCH SCIENTISTS / POSTDOCS / ALUMNI

RESEARCH SCIENTISTS (Current 10)

- Alexander Ukhov, KAUST, Jan 2024 – present
Ph.D. Ural Federal University, Yekaterinburg, Russia
Air pollution modeling, source inversion and forecasting
- Matteo Zampieri, KAUST, Oct 2022 – present
Ph.D. University of Padova, Padova, Italy
Subseasonal-to-seasonal forecasting
- Junchuan Sun, KAUST, Oct 2022 – present

Ph.D. Institute of Oceanology, Chinese Academy of Sciences (IOCAS), China
Ocean modeling and climate projections of the Red Sea and Arabian Gulf

- Daquan Guo, KAUST, July 2022 – present
Ph.D. Earth Sciences and Engineering, KAUST, KSA
Ocean modeling and physical oceanography
- Thang Luong, KAUST, Jul 2022 – present
Ph.D. University of Arizona, Tucson, USA
Atmospheric modeling and rainfall variability
- Yanhui Zhang, KAUST, Nov 2020 – present
Ph.D. University of Bergen, Bergen, Norway
Reservoir history matching
- Siva Sanikommu, KAUST, Mar 2020 – present
Ph.D., Andhra University, Visakhapatnam, India
Ocean data assimilation and forecasting
- Shehzad Afzal, KAUST, Mar 2020 – present
Ph.D., Purdue University, West Lafayette, USA
Visualization and analytics of ensemble simulations of the Red Sea
- Boujemaa Ait-El-Fquih, KAUST, Aug 2015 – present
Ph.D. Telecom & Management SudParis, Evry, France
Bayesian inference and signal processing
- Hari Dasari, KAUST, KAUST, Feb 2015 – present
Ph.D. Andhra University, Visakhapatnam, India
Atmospheric modeling and analysis

POSTDOCS (Current 10)

- Yixin Wang, KAUST, Dec 2023 – present
Ph.D. Marine Sciences and Engineering, KAUST, KSA
Marine ecosystem modeling and variability
- Samah El-Mohtar, KAUST, Nov 2023 – present
Ph.D. Earth Sciences and Engineering, KAUST, KSA
Oil spill modeling and uncertainty quantification
 - Wenqiang Cui, KAUST, Sep 2023 – present
Ph.D. Norwegian University of Science and Technology, Trondheim, Norway
Visual Analytics
 - Jithendra Nadimpalli, KAUST, May 2023 – present
Ph.D. Indian Institute of Technology Madras, Chennai, India
Ocean modeling and physical oceanography
 - A.G. Prajeesh, KAUST, Jan 2023 – present
Ph.D. Indian Institute of Tropical Meteorology, Pune, India
Coupled ocean-atmosphere modeling
 - Naila Raboudi, KAUST Postdoc, Dec 2022 – present
Ph.D. Earth Sciences and Engineering, KAUST, KSA
Ensemble ocean data assimilation
 - Charls Antony, KAUST Postdoc, Dec 2022 – present
Ph.D. Indian Institute of Science Education and Research (IISER), Bhopal, India
Storm surge modeling, analysis and prediction
 - Saquib Saharwardi, KAUST Postdoc, Mar 2022 – present
Ph.D. Indira Gandhi Centre for Atomic Research Safety, India

Climate modelling and hydroclimatic extremes

- Koteswararao Vankayalapati, KAUST Postdoc, Oct 2021 – present
Ph.D. Andhra University, Andhra, India
Atmospheric science and remote sensing
- Raju Pathak, KAUST Postdoc, September 2021 – present
Ph.D. IIT Delhi, New Delhi, India
Climate modeling and variability
- Harikishan Gandham, KAUST Postdoc, Sep 2021 – present
Ph.D. Indian Institute of Tropical Meteorology, Pune, India
Remote sensing and variability of aerosols and green-house-gases
- Rama Krishna, KAUST Postdoc, Jan 2020 – present
Ph.D. Indian Institute of Tropical Meteorology, Pune, India
Atmospheric aerosols modeling and variability

ALUMNI (17 Postdocs, 3 Research Scientists)

- Sumit Dandapat KAUST Postdoc, July 2020 – Dec 2023
Ocean modeling and physical oceanography
Research Scientist, National University of Singapore, Singapore
- P.T. Rakesh, KAUST Postdoc, Mar 2022 – Nov 2023
Urban atmospheric modeling
Research Scientist, Indira Gandhi Centre for Atomic Research, Tamil Nadu, India
- Tao Zhang, KAUST Postdoc, Oct 2021 – Oct2023
Reservoir modeling and machine learning
Associate Professor, China University of Petroleum, Beijing, China
- Fanglou Liao, KAUST Postdoc, Feb 2022 – Jan2023
Ocean modeling and physical oceanography
Associate Professor, Northwestern Polytechnical University, Xi'an, China
- Sabique Langodan, KAUST, Jan 2019 – Mar 2022
Wave and wind modeling
Scientist-II, Aramco, KSA
- Peng Zhan, KAUST research scientist, Dec 2019 – Dec 2021
Ocean modeling and physical oceanography
Assistant Professor, Southern University of Science and Technology, Shenzhen, China
- Fengchao Yao, KAUST Research Scientist, Jan 2015 – May 2020
Ocean modeling and physical oceanography
Associate Professor, Sun Yat-Sen University, Guangzhou, China
- Jieshuo Xie, KAUST Postdoc, Jun 2016 – Dec 2018
Modeling and studying the southern Red Sea circulation and exchange with the Gulf of Aden
Associate Professor, South China Sea Institute, Chinese Academy of Sciences, Guangzhou, China
- Raju Attada, KAUST Postdoc, Aug 2015 – Nov 2018
Atmospheric modeling and seasonal predictions
Assistant Professor, Indian Institute of Science Education and Research, Mohali, India
- Ravi Kunchala, KAUST Postdoc, Feb 2017 – Mar 2018
Aerosol and atmospheric chemistry modeling
Assistant Professor, Indian Institute of Technology - IIT Delhi, India
- Aditya Kartadikaria, KAUST Postdoc, Dec 2013 – Nov 2016
Physical oceanography and ocean modeling
Assistant Professor, Bandung Institute of Technology, Indonesia

- Rabih Ghostine, KAUST Postdoc, Jun 2013 – July 2016
Partial differential equations, flood modeling
Assistant Professor, Kuwait College of Science and Technology, Kuwait
- Ihab Sraj, KAUST postdoc, Aug 2013 – Sep 2015
Uncertainty quantification
Research Scientist, Duke University, USA
- Bo Lui, KAUST Postdoc, Aug 2012 – Mar 2015
Gaussian-mixture filtering in high dimensional systems
Research Scientist, King Fahd University of Mineral and Petroleum (KFUPM), Saudi Arabia
- Thomas Höllt, KAUST Postdoc, Jan 2014 – Mar 2015
Visualizing uncertainties in large scale ensemble data assimilation systems
Assistant Professor, Leiden University, Netherlands
- Yesubabu Viswanadhapalli, KAUST Postdoc, May 2013 – Nov 2014
Atmospheric data assimilation and prediction
Research Scientist, National Atmospheric Research Laboratory, Andhra Pradesh, India
- Ahmed El-Sheikh, KAUST & UT-Austin joint Postdoc, May 2012 – Aug 2013
Uncertainty quantification and reservoir history matching
Assistant Professor, Heriott-Watt University, Edinburgh, Scotland
- Dionysios Raitsos, KAUST Postdoc, April 2011 – Feb 2013
Remote Sensing of Red Sea Phytoplankton, Fisheries, and Climate Change
Assistant Professor, University of Athens, Athens, Greece
- Umer Altaf, KAUST Postdoc, July 2010 – Apr 2012
Reduced-order variational data assimilation
Research Scientist, Delft University of Technology, Delft, Netherlands
- Xiaodong Luo, KAUST Postdoc, Jan 2010 – Jun 2012
Ensemble and non-Gaussian Bayesian filtering
Research Scientist, International Research Institute of Stavanger (IRIS), Bergen, Norway

INVITED TALKS AND LECTURES

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- Invited lecturer, 7th International Conference on Ocean Engineering (ICOE 2025), Chennai, India, September 2025.
- Invited speaker, Fourth International Conference on Mathematics and Statistics (ICMS20), American University of Sharjah, UAE, February 2025.
- Plenary speaker-panelist, Climate Crisis in the Eastern Mediterranean and Middle East Conference, The Cyprus Institute, Larnaka, Cyprus, October 2024.
- Invited speaker-panelist, Deep Ocean Forum 2024 KAUST, Thuwal, Saudi Arabia, October 2024.
- Keynote speaker, Current Trends in Atmospheric and Oceanic Processes related to Climate Change Studies (CURTAIN RAISE), Andhra, India, September 2024.
- Panelist, Workshop on "The Red Sea Region - a Climate Refuge for Coral Reefs", Jeddah, Saudi Arabia, September 2024.
- Keynote speaker and session organizer, Energy Summit 2024, KAUST, Thuwal, Saudi Arabia, September 2024.
- Keynote speaker, 12th Saudi HPC & AI, Abha, Saudi Arabia, September 2024.
- Panelist, SpaceTech Empowerment, KAUST National Transformation Institute, Thuwal, Saudi Arabia, August 2024.
- Keynote speaker at COP16 UNCCD meeting on droughts, Riyadh, Saudi Arabia, June 2024.

- Invited speaker, Geospatial and Radar Technologies for improved weather modelling towards effective Disaster Management (GRADM), Hyderabad, India, June 2024.
- Plenary talk, Earth Sciences Thematic Program on Climate Change and the Eastern Mediterranean, Beirut, Lebanon, May 2024.
- Invited talk, Workshop on Ocean Modeling for the Eastern Mediterranean, American University of Beirut, Beirut, Lebanon, May 2024.
- Panelist, Fleet 3.0 meeting, Riyadh, Saudi Arabia, May 2024.
- Invited talk, Hellenic Center of Marine Research, HCMR, Anavyssos, Greece, May 2024.
- Invited talk, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan, Mar 2024.
- Invited talk, Center for Computational Sciences, Tsukuba University, Japan, Mar 2024.
- Lead talk, National Symposium TROPMET – 2023 organized by Indian Meteorological Society (IMS) and jointly hosted by Indian Meteorological Society (IMS), Jaipur, India, November 2023.
- Invited talk, APL-CMCC-ACCESS Workshop: Empowering human wellbeing through advances in climate analysis and prediction, JAMSTEC, Tokyo, Japan, November 2023.
- Invited talk, Climate Change and the Mediterranean, American University of Beirut, Lebanon, November 2023.
- Invited panelist and speaker at MENA Climate Week, Riyadh, KSA, October 2023.
- National Workshop for Early Warning, Riyadh, June 2023.
- Plenary talk, 3rd International Symposium on Indian Ocean Earth Sciences, Shenzhen, China, June 2023.
- Invited talk, Stochastic Numerics and Statistical Learning: Theory and Applications Workshop, KAUST, KSA, May 2023.
- Plenary talk, OceanPrediction Decade 1st Workshop: Indian Seas, INCOIS, Hyderabad, India, May 2023. Plenary talk, 3rd International Symposium on Indian Ocean Earth Sciences, Shenzhen, China, June 2023.
- Invited talk, KAUST Research Conference: Sustainable Energy Materials and Technologies for a Low Carbon Future, March 2023.
- Invited talk, 2nd Workshop on sharing industrial data for ocean-climate modelling, IOC/UNESCO, Paris, France, March 2023.
- Plenary talk, National Risk Council - The National Forum for Risk, Emergency, and Business Continuity Management, Riyadh, KSA, November 2022.
- Invited talk, 1st Workshop on sharing industrial ocean data for ocean-climate modelling, Intergovernmental Oceanographic Commission of UNESCO, Bergen, November 2022.
- Plenary talk, Egyptian National Institute of Oceanography and Fisheries, COP27, Sharm El-Sheikh, Egypt, November 2022.
- Plenary talk, PetroEnvironment 2022, Dammam, Saudi Arabia, May 2022.
- DARC group Seminar series, University of Reading, UK, May 2022.
- Keynote speaker, ACWAPower & KAUST Innovation Days, KAUST, KSA, Mar 2022.
- Keynote speaker, Workshop on Sustainable Food Security, KAUST, KSA, March 2022.
- Seminar series Applied Mathematics Department, Imperial College, UK, January 2022.
- Panelist, International Training Centre for Operational Oceanography (ITCOOcean), INCOIS, India, December 2021.
- Panelist, AEON Collective, COP26, Glasgow, UK, November 2021.
- Uncertainty Quantification Webinar, RWTH Aachen University, October 2021.
- Hellenic Center of Marine Sciences, Anavissos, Greece, September 2021.
- WEB series at Andhra University, January 2021.
- Schlumberger webinar, November 2020.

- The Gulf environment: Understanding and managing the challenges, New York University – Abu Dhabi, January 2020.
- Keynote Speaker, International Symposium on 'Advances in Coastal Research with Special Reference to Indo Pacific - AdCoRe IP-2019, Chennai, India, December 2019.
- Keynote Speaker, National Symposium on Land, Ocean and Atmosphere Interactive Processes in the Context of Weather and Climate – TROPMET 2019, Visakhapatnam, India, December 2019.
- Applied and Computational Analysis, University of Cambridge, Cambridge, UK, October 2019.
- Scientific grand challenges and new perspectives in Applied Mathematics, University of Victoria, Canada, August 2019.
- Workshop on stochastic parameterizations and their use in data assimilation, Imperial College, London, UK, July 2019.
- World Statistics Congress 2019, Kuala Lumpur, Malaysia, July 2019.
- Workshop on Conservation Principles, Data & Uncertainty in Atmosphere-Ocean Modelling, University of Potsdam, Berlin, Germany, April 2019.
- Indian Institute of Technology (IIT), Delhi, February 2019.
- Plenary talk, World Ocean Science Congress, Andhra University, Visakhapatnam, India, February 2019.
- Petro Environment 2019, Dammam, Saudi Arabia, February 2019.
- Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Yokohama, Japan, January 2019.
- CLAIM Project Assembly, Camogli, Italy, November 2018.
- Laboratoire de Météorologie Dynamique (LMD), École Normale Supérieure de Paris, France, July 2018.
- SIAM Conference on Uncertainty Quantification, Garden Grove, USA, April 2018.
- Lecturer, GODAE New Frontiers of Operational Oceanography, Majorca, Spain, October 2017.
- International Computing in the Atmospheric Sciences, Annecy, France, September 2017.
- Keynote Speaker, International Conference on Data Science and Environment, Brest, France, July 2017.
- Keynote Speaker, International Conference on Understanding, Predicting, and Projecting Climate Change over Asian Region, National Atmospheric Research Laboratory, Tirupati, India, June 2017.
- Scripps Institution of Oceanography, San Diego, USA, May 2017.
- National Center of Atmospheric Research (NCAR), Boulder, USA, May 2017.
- Department of Mechanical Engineering, MIT, Boston, USA, May 2017.
- Plymouth Marine Laboratory, Plymouth, UK, May 2017.
- Indian Meteorological Department (IMD, Delhi); Indian Institute of Technology (IIT, Delhi); National Center of Medium Range Weather Forecasting (NCMRWF, Noida), Indian Institute of Tropical Meteorology (IITM, Pune); Indian National Center of Ocean Information Services (INCOIS, Hyderabad); National Atmospheric Research Laboratory (NARL, Tirupati), India, Feb 2017.
- Texas A&M University, Doha, Qatar, November 2016.
- COP22, Marrakesh, Morocco, November 2016.
- Society of Exploration Geophysicists (SEG), Characterization of Tight Reservoirs Forum, Bahrain, November 2016.
- Lecturer of a short course on "Data Assimilation", Summer School on "Remote Sensing Synergy", Brest, France, June 2016.
- ECCOMAS Congress 2016, Crete, Greece, June 2016.
- Imperial College, London, UK, May 2016.
- University of Oxford, Oxford, UK, May 2016.
- University of Reading, Reading, UK, May 2016.
- SIAM Conference on Uncertainty Quantification, Lausanne, Switzerland, April 2016.

- Workshop on Physics-Based Descriptions of Flow Architecture in Large Volumes of Reservoir Rock, KAUST, KSA, April 2016.
- International Conference on Computational Imaging and Visualization, KAUST, March 2016.
- Tutorial on "Ocean quantification in Geophysical Fluid Flow Models", Ocean Sciences, New Orleans, Louisiana, USA, February 2016.
- Journee MEOM au Vert, Workshop on "Data Assimilation", Grenoble, France, September 2015.
- Climate, Atmospheric Science and Physical Oceanography (CASPO), Scripps Institution of Oceanography, La Jolla, CA, USA, July 2015.
- Lecturer of a short course on "Data Assimilation in the Geosciences", SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Stanford, CA, USA, July 2015.
- SIAM Conference on Mathematical and Computational Issues in the Geosciences, Stanford, CA, USA, July 2015.
- Department of Earth Science and Engineering, Imperial College, London, UK, June 2015.
- Nansen Environmental and Remote Sensing Center (NERSC), Bergen, Norway, June 2015.
- Plenary talk, 10th International EnKF Workshop, Bergen, Norway, June 2015.
- Lecturer at the summer school on Data Assimilation, NCAR, Colorado, USA, May 2015.
- Workshop on "Theoretical aspects of ensemble data assimilation for the earth system", School of Physics, Les Houches, France, April 2015.
- Department of Physical Oceanography, Ocean University of China, Qingdao, China, March 2015.
- Workshop on "Data assimilation in the Sciences: Focus on Geophysical and Neuroscience Applications", Fudan University, Shanghai, China, March 2015.
- Workshop on "Modeling the dynamics and biogeochemistry of the Arabian Sea", New York University, Abu Dhabi, UAE, January 2015.
- Electrical Engineering Department, King Fahd University of Petroleum and Minerals, Dammam, KSA, December 2014.
- Plenary talk, Saudi Arabian High Performance Computing User's Group Conference, Khobar, KSA, December 2014.
- Minisymposium on "Statistics of Extreme Events", KAUST, November 2014.
- ARAMCO upstream symposium, KAUST, November 2014.
- Center for Energy and Geo-Processing Workshop, King Fahd University of Petroleum and Minerals, Dammam, KSA, September 2014.
- Workshop on "Atmospheric and Ocean Modeling", American University of Beirut, Beirut, Lebanon, August 2014.
- Minisymposium on "Improving climate and weather prediction through data-driven statistical modeling" at the 10th AIMS conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 2014.
- Workshop on "Filtering High Dimensional Complex systems", Warwick, UK, June 2014.
- Plenary talk, Workshop on "Ocean Prediction and Risk Management: Environmental challenges of the Oil and Gas Industry in Lebanon", American University of Beirut (AUB), Beirut, Lebanon, April 2014.
- "Visualization Summit 2014", Invited talk, KAUST, KSA, April 2014.
- Workshop on "Spatial Statistics for Environmental and Energetic Challenges", KAUST, April 2014.
- Department of Atmospheric and Ocean Science, University of Maryland, USA, November 2013.
- Department of Mechanical Engineering, MIT, Boston, USA, Sep 2013.
- Department of Meteorology, Stockholm University, Sweden, August 2013.
- Lecturer, "Data Assimilation Summer School", Cluj, Romania, August 2013.
- Plenary talk, "The Oxford Conference on Challenges in Applied Mathematics", Oxford University, July 2013.

- International meeting on "Convection, Clouds, and Tropical Meteorology", Indian Institute of Science, Bangalore, India, Jan 2013.
- Workshop on "Applied and Computational Mathematics", KFUPM, KSA, December 2012.
- IAMCS workshop on "Climate Science and Spatial Statistics", Texas A&M, USA, October 2012.
- Oxford Center for Collaborative Applied Mathematics, Oxford University, July 2012.
- Applied Modeling and Computational Group, Imperial College, UK, July 2012.
- 10th World Conference on Computational Mechanics", WCCM, Sao Paulo, Brazil, July 2012.
- InterPore mini-symposium "Advances in Modeling, Simulation and Data Integration for Subsurface Reservoirs", Purdue University, West Lafayette, Indiana, USA, May 2012.
- SIAM conference on "Uncertainty Quantification", Raleigh, North Carolina, USA, April 2012.
- First NYUAD climate workshop, New York University Abu Dhabi, UAE, March 2012.
- Courant Institute of Mathematical Sciences, New York University, New York, February 2012.
- Met Office, reading, UK, July 2011.
- OCCAM, Oxford University, UK, July 2011.
- IMA Workshop on "Large scale inverse problems and quantification of uncertainty", University of Minnesota, USA, June 2011.
- IAMCS summer workshop, Texas A&M, USA, May 2011.
- Plenary talk, Second annual meeting of the Lebanese Society of Mathematical Sciences, Lebanon, April 2011.
- American University of Beirut, Center of Advanced Mathematical Sciences, Lebanon, April 2011.
- Scripps Institution of Oceanography, La Jolla, CA, March 2011.
- Workshop on "Large scale inverse Problems and Quantification of Uncertainty", Texas A&M, USA, February 2011.
- "MyOcean Sciences Days 2010" workshop, Toulouse, France, December 2010.
- Workshop on "Optimization, Design and Control", University of Oxford, UK, September 2010.
- Plenary talk, "Munich Center of Advancing Computing Summer Workshop", Technical University of Munich, Germany, July 2010.
- Laboratoire Jean Kuntzmann, University of Grenoble, France, November 2009.
- Workshop on "Data Assimilation in Geosciences", Texas A&M, USA, October 2009.
- Instituto Superior Tecnico, Lisbon, Portugal, April 2009.
- SIAM conference on "Computational Sciences and Engineering", Miami, USA, March 2009.
- Institute of Computational Engineering and Sciences, University of Texas-Austin, USA, July 2008.
- SIAM "Annual Meeting", San Diego, USA, April 2008.
- Center of Coastal Margins Observations and Prediction, OGI School of Science and Engineering, November 2007.
- Department of Atmospheric and Oceanic Sciences, University of Maryland, August 2007.
- Institute for Mathematics Applied to Geosciences, National Center of Atmospheric Research (NCAR), May 2007.
- Hellenic Center of Marine Research, HCMR, Anavyssos, Greece, July 2005.
- Institute of Marine Biology (IMBC), Crete, Greece, November 2002.
- Laboratoire d'Ecoulement Geophysique et Industriel (LEGI), Institut National Polytechnique de Grenoble, France, March 2001.

- Advisory Board member of the "DST Center of Excellence in Climate Modeling", IIT Delhi, India, SEP 2024 – Present.
- Topic leader in "Ocean Forecasting", African Regional Hub of the OceansPredict UN Decade Collaborative Centre, June 2023 – present.
- Member of the Steering committee of OceansPredict Decade UN - Indian Seas, May 2023 – present.
- Member of the Taskforce on Marine Environment, Force-Eastern Mediterranean and Middle East Climate Change Initiative (EMME CCI), Mar 2023 – present.
- Member of the Ocean Forecasting Co-design Team, OceansPredict UN Decade Collaborative Center, Feb 2023 – present.
- Member of the Red Sea Security and Emergency Preparedness Taskforce, May 2022 – Apr 2023.
- Representative of the Red Sea and Gulf of Aden Sustainability Taskforce, Saudi Royal Decree (#39662), Apr 2021 – Mar 2023.
- Member of the Cyprus Climate Initiative Marine Environment/Resources Task force, May 2020 – Apr 2022.
- Member of the Saudi General Authority of Meteorology and Environmental Protection (GAMEP) Steering Committee for Marine and Coastal Protection Assessment, Jul 2020 – Jun 2021.
- Editorial Board Member, PLOS ONE, Oct 2018 – present.
- Associate Editor, Atmospheric Science Letters, Royal Meteorological Society, Mar 2017 – present.
- Associate Editor, Computational Geosciences, Springer, Aug 2015 – present.
- Advisory Board member of the "Cleaning Marine Litter by Developing and Applying Innovative Methods" (CLAIM) EU project involving 19 European Institutions, Aug 2017 – Jun 2022.
- Editorial Board Member, Scientific Reports, May 2019 – Oct 2021.
- Associate Editor, Mathematics of Climate and Weather Forecasting, Apr 2019 – Aug 2021.
- Member of the Ministry of Environment Water and Agriculture (MEWA) advisory group for Rainfall Augmentation in Saudi Arabia, Apr 2018 – Jan 2019.
- Member of the Ministry of Environment Water and Agriculture (MEWA) working group on Surface Fresh Water in the Kingdom, February 2018 – Feb 2019.
- Guest Editor, *Remote Sensing of Ocean Colour*, Journal of Remote Sensing, Jun 2018.
- Guest Editor, *Remote Sensing of Groundwater from River Basin to Global Scales*, Journal of Remote Sensing, Mar 2018.
- Advisory Board member of the "Weather Services Development in the Kingdom", General Authority of Meteorology and Environmental Protection (GAMEP), Jun 2017 – Dec 2018.
- Reviewer for Nature Communications; Proceedings of the National Academy of Sciences (PNAS); Monthly Weather Review; Computational Geosciences; Journal of Geophysical Research; Tellus; Ocean Modelling; Quarterly Journal of the Royal Meteorological Society; Inverse Problems, Remote Sensing of Environment; Geophysical Research Letters; Progress in Oceanography; Journal of Marine Systems; International Journal of Numerical Methods in Fluids; Journal of Atmospheric and Ocean Dynamics; Ocean Dynamics; Deep Sea Research; Oceanologia; PLOS ONE; Marine Environmental Research; Computer Methods in Applied Mechanics and Engineering; International Journal of Climatology; Computer and Geosciences; Journal of Hydrology; Water Resources Research, Journal of Environmental Modeling and Software; Journal of Environmental Management; Society of Petroleum Engineering; Journal of Petroleum Exploration and Production Technology; Advances in Water Resources; Advances in Modeling Earth Systems; Journal of Geophysics and Engineering; Pure and Applied Geophysics; Transport in Porous Media; International Journal of Electronics and Communications; The American Statistician; EURO Journal on Computational Optimization; SIAM/ASA Journal on Uncertainty Quantification; Science Bulletin.
- Ph.D. thesis committees of Jennifer Karam (American University of Beirut, Lebanon, Apr 2024); Jaafar Younes (American University of Beirut, Lebanon, Oct 2024); Yannis Hatzonikolakis (University of Athens,

Greece, May 2023); K. Srinivasu (Andhra University, India, Nov 2020); Rong Hu (Imperial College, UK, Oct 2019); Nanaji Rao (Andhra University, India, Sep 2018); Dimitra Papageorgiou (University of Athens, Greece, Feb 2018); Dunhui Xiao (Imperial College, UK, May 2016); Bogdan Sebacher (Delft Institute of Technology, Netherlands, Dec 2014); Talea Mayo (University of Texas at Austin, USA, Sep 2013); Abdullah Mazraoui (KFUPM, KSA, Jun 2011); Angela Cana (Lisbon Institute of Technology, Portugal, Apr 2009).

- M.Sc. thesis defense committees of Maryam Al-Shamlan (Qatar University, Nov 2023); Omar Hakla (American University of Beirut, Lebanon); Alexios Rustom (American University of Beirut, Lebanon, Aug 2020); Maissa AlKhayat (Effat University, KSA, Apr 2020); Samah El-Mohtar (American University of Beirut, Lebanon, July 2017); Sameer Gharbi (King Abdulaziz University, KSA, Mar 2012).
- Reviewer for National Science Foundation (NSF – USA); European Union (EU) research; German Research Foundation (DFG); French National Center for Scientific Research (CNRS), Australian Research Council; Portuguese Polar Program (PROPOLAR); Indian Ministry of Earth Sciences, Khalifa University (UAE); Netherlands Vidi Funding Programme.
- Elected member of the UNESCO Center of Pure and Applied Mathematics (CIMPA), 2012 – present.
- Member of the Society of Industrial and Applied Mathematics (SIAM), the American Geophysical Union (AGU), and the European Geophysical Union (EGU).

PATENTS

- F. Sana, T. Ballal, T. Al-Nafouri, and **I. Hoteit**: *Apparatus and method for wireless monitoring using ultra-wideband frequencies*. US Patent No. 11,207,017, November 2021.
- F. Ravanelli and **I. Hoteit**: *History matching of time-lapse crosswell data using ensemble Kalman filtering*. US Patent No. 10.670.753, June 2020.
- C. Claudelle, M. Abdelkader, M. Shaqura, and **I. Hoteit**: *Apparatus and method for Lagrangian precipitation sensing*. EU Patent No. 2014850099, February 2018.
- F. Sana, T. Ballal, **I. Hoteit** and T. Y. Al-Naffouri: *System and method for non-invasive extraction of electrocardiogram signals*. US Patent No. WO2018109669, June 2018.

AWARDS

- Recipient of the prestigious Kuwait Prize (KFAS) award in the field of Basic Sciences, May 2021.
- Finalist in Environment for the 2017 World Technology Awards, World Technology Network (WTN), Nov 2017.
- Co-recipient of the second-best poster award at the International Petroleum Engineering Conference (IPTC), Doha, January 2014.
- Co-recipient of an honorable mention (top five papers), PacificVis Symposium, Sidney, Australia, February 2013.
- Co-recipient of the best poster award at the Richard Tapia Celebration of Diversity in Computing Conference, San Francisco, USA, April 2011.
- Co-recipient of the best poster award at the SIAM conference on Mathematical and Computational Issues in Earth Sciences, Long Beach, USA, March 2011.
- PhD Fellowship from the French Government 1998 – 2002.

INTERNATIONAL CONFERENCE ACTIVITIES AND COMMITTEES MEMBER

- Member of the Advisor Committee of the 7th International Conference on Ocean Engineering (ICOE2025), September 14-18, 2025, IIT Madras, Madras, India.

- Member of the Technical Committee, The Middle East Oil, Gas and Geosciences Show (MEOS GEO), Bahrain, September 2025.
- Co-chair of the session "18th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Singapore, July 2025.
- Chair of the Session "Drought and Ecosystems in Arid Regions", UNCCD Drought Resilience +10 Conference, Geneva, Switzerland, October 2024.
- Chair of the Organizing Committee of the workshop "Bridging Knowledge to Action: Managing Drought in the Kingdom of Saudi Arabia and Beyond", Riyadh, Saudi Arabia, June 2024.
- Member of the Scientific Committee of the 23th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-23), Singapore, September 2024.
- Co-chair of the session "17th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Gangwon-do, South Korea, June 2024.
- Chair of the session "Advances in Ocean Data Assimilation, Forecasting and Reanalysis", Ocean Sciences, New Orleans, USA, February 2024.
- Chair of the Organizing Committee of the workshop "Analyzing CMIP6 Climate Change Projections over the Kingdom: A Step-Wise Demonstration for the Capital Region of Riyadh" jointly organized with the National Center of Meteorology, Princess Noor University, Riyadh, September 2023.
- Chair of the Organizing Committee of the workshop "Analyzing CMIP6 Climate Change Projections over the Kingdom: A Step-Wise Demonstration for the Capital Region of Riyadh" jointly organized with the National Center of Meteorology, King Saud University, Riyadh, September 2023.
- Chair of the Organizing Committee of the workshop "Analyzing CMIP6 Climate Change Projections over the Kingdom: A Step-Wise Demonstration for the Holy City of Makkah", National Center for Meteorology, Jeddah, KSA, April 2023.
- Chair of the Organizing Committee of the workshop "Building Capabilities for Monitoring and Projecting the MENA Climate" jointly organized with the National Center of Meteorology, Jeddah, KSA, January 2023.
- Co-chair of the session "16th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Singapore, July 2023.
- Chair of the Organizing Committee of the workshop "Climate Change Risks, Challenges and Opportunities" jointly organized with the National Center of Meteorology, KAUST, September 2022.
- Member of the Scientific Committee of the 21th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-22), Basel, Switzerland, July 2022.
- Co-chair of the session "15th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Virtual, July 2022.
- Chair of the session "Advances in Ocean Data Assimilation, Forecasting and Reanalysis", Ocean Sciences, Honolulu, Hawaii, USA, February 2022.
- Co-chair of the session "14th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Singapore, August 2021.
- Member of the Scientific Committee of the 20th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-20), Cluj-Napoca, Romania, June 2021.
- Co-chair of the session "13th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Hongcheon, South Korea, July 2020.
- Member of the Scientific Committee of the 19th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-19), Warsaw, Poland, July 2020.
- Co-Chair of the mini-symposium "Data Assimilation in the Geosciences", SIAM Conference on Uncertainty Quantification, Munich, Germany, April 2020.
- Chair of the session "Advances in Ocean Data Assimilation, Forecasting and Reanalysis", Ocean Sciences, San Diego, California, USA, February 2020.

- Member of the Working Group of the 1st Red Sea Summit, KAUST, Saudi Arabia, October 2019.
- Member of the Scientific Committee of the 3rd Workshop on "Frontiers of Uncertainty Quantification in Fluid Dynamics", Pisa, Italy, September 2019.
- Co-chair of the session "12th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Singapore, July 2019.
- Member of the Scientific Committee of the 18th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-19), Amsterdam, Netherlands, June 2019.
- Co-chair of the mini-symposium "Advances in Bayesian estimation strategies in subsurface processes", SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Houston, Texas, USA, March 2019.
- Member of the Scientific Committee of the 7th International Symposium on Data Assimilation, Kobe, Japan, January 2019.
- Member of the Program Committee of the 21st IEEE International Conference on Computational Science and Engineering (CSE-2018), Bucharest, Romania, October 2018.
- Co-chair of the session "11th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Honolulu, Hawaii, USA, June 2018.
- Member of the Scientific Committee of the 17th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-2018), Geneva, Switzerland, June 2018.
- Co-Chair and Member of the Scientific Committee of the "Uncertainty Quantification Workshop", Kobe, Japan, February 2018.
- Chair of the session "Advances in Data Assimilation and Uncertainty Quantification for Ocean Forecasting and Analyses", Ocean Sciences, Portland, Oregon, USA, February 2018.
- Session chair in the "7th International Envirocities 2017 conference -- Sustainable Innovations: Technologies, solutions and Best Practices", Yanbu Industrial City, KSA, November 2017.
- Member of the Scientific Committee of the "GODAE International School -- New Frontiers of Operational Oceanography", Majorca, Spain, October 2017.
- Chair of the mini-symposium "Ensemble-Based Data Assimilation and Optimization in Geosciences", SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Erlangen, Germany, September 2017.
- Co-chair of the mini-symposium "Advances in Uncertainty Quantification Methods for Hydrological Sciences", SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Erlangen, Germany, September 2017.
- Co-chair of the session "10th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Singapore, August 2017.
- Member of the Scientific Committee of the "International Conference on Data Science and Environment", Brest, France, July 2017.
- Member of the Scientific Committee of the 16th IEEE International Symposium on Parallel and Distributed Computing (ISPDC-2017), Innsbruck, Austria, July 2017.
- Chair of the session "Climate change", International Conference of the Marine Environment of the Red Sea (ICMERS), KAUST, KSA, November 2016.
- Host of the "Big Data" Session in the "KAUST Research Conference: Advances in Well Construction with Focus on Near-Wellbore Physics and Chemistry", KAUST, KSA, November 2016.
- Co-chair of the session "9th Sasaki Symposium on Data Assimilation for Atmospheric, Oceanic, and Hydrologic Applications", AOGS Annual Meeting, Beijing, China, August 2016.
- Chair of the mini-symposium "Quantifying uncertainties in Large Scale (Atmospheric and Oceanic) Models", SIAM Conference on Uncertainty Quantification, Lausanne, Switzerland, April 2016.
- Chair of the session "Developments and Ocean Applications of Data Assimilation, Uncertainty and Sensitivity Analyses", Ocean Sciences, New Orleans, Louisiana, USA, February 2016.

- Chair of the mini-symposium "Ensemble-Based Data Assimilation in Geosciences", SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Stanford University, CA, USA, July 2015.
- Chair of the mini-symposium "Uncertainty Quantification in the Geosciences", SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Stanford University, CA, USA, July 2015.
- Organizing Committee member of the SIAM Conference on the Computational and Mathematical Issues in the Geosciences, Stanford University, California, USA, July 2015.
- Member of the Scientific Committee of the "1st Mediterranean Gas and Oil International Conference (MedGO)", Rafik Hariri University, Beirut, Lebanon, April 2015.
- Member of the Organizing Committee of "EMI2014 Conference of the American Society of Civil Engineering", Calgary, Canada, August 2014.
- Chair of the mini-symposium "Uncertainty Quantification in Environmental Fluid", SIAM Uncertainty Quantification Meeting, Savannah, Georgia, USA, April 2014.
- Co-organizer and member of the Scientific Committee of the "2nd International KAUST-KACST-JCCP Workshop on Surface and Subsurface Reservoir 4D monitoring", KAUST, March 2014.
- Organizer of the "Data Assimilation Short course", KAUST, March 2014.
- Chair of the session "Data Assimilation and Uncertainty Quantification in Ocean Modeling", Ocean Sciences Meeting, Honolulu, Hawaii, USA, February 2014.
- Chair of the mini-symposium "Uncertainty Quantification in Climate Modeling and Prediction", SIAM Annual Meeting, San Diego, USA, July 2013.
- Co-chair of the mini-symposium "Uncertainty Quantification and Optimization for Subsurface Flow Models", SIAM Conference on Mathematical and Computational Issues in Geosciences, Padova, Italy, June 2013.
- Committee member of the 12th IEEE International Symposium on Parallel and Distributed Computing (ISPDC 2013), Bucharest, Romania, June 2013.
- Co-organizer of the NYU-AD workshop on "A frontier in modern oceanography: Modeling, observing and assimilating submesoscale dynamics", Abu Dhabi, April 2013.
- Organizer of the first KAUST-OCCAM Modeling Camp, KAUST, January 2013.
- Committee member of the 11th IEEE International Symposium on Parallel and Distributed Computing (ISPDC 2012), Munich, Germany, June 2012.
- Organizer of the "Uncertainty Quantification" session in the IAMCS summer workshop, KAUST, May 2012.
- Chair of the session "Sensitivity analysis, data assimilation and uncertainty quantification in Ocean modeling", Ocean Sciences Meeting, Salt Lake City, Utah, USA, February 2012.
- Organizer of the KAUST WEP plenary session on "A modern mathematical view of an uncertain world", KAUST, January 2012.
- Organizer of the KAUST CIMPA winter school in "Applied and Computational Mathematics on Uncertainty Quantification" (70 participants), KAUST, January 2012.
- Member of the scientific committee of the "Workshop on Cyber Physical Systems for Developing Nations", LUMS School of Science & Engineering, Lahore, Pakistan, November 2011.
- Organizer of the workshop "Optimization and Uncertainty quantification of Ocean Boundary Layers Physics", University of Oxford, August 2011.
- Organizer of the "postdoctoral research" session in the IAMCS summer workshop, KAUST, June 2011.
- Coordinator and member of the scientific committee of the "Applied Inverse Problems Conference", College Station, USA, May 2011.
- Organizer of the "Red Sea Modelling and Circulation session" in the KAUST Red Sea Center opening Symposium, KAUST, April 2011.

- Co-chair of the mini-symposium "Simulation, Optimization, and Assimilation of Subsurface Reservoirs", SIAM Conference on Mathematical and Computational Issues in Geosciences, Long Beach, USA, March 2011.
- Organizer of the first KAUST Study Group in Mathematics and Industry (80 participants), KAUST, January 2011.
- Chair of the first symposium in "Data Assimilation and Inverse Problems in Geosciences" at the 8th International Conference in Numerical Analysis and Applied Mathematics, Rhodes, Greece, September 2010.
- Organizer of the "Data Assimilation and Inverse Problems" session in the IAMCS summer workshop, KAUST, June 2010.

KAUST SERVICES AND COMMITTEES

- MEWA KAUST Strategic Executive Committee, Jun 2024 – present.
- Change Management Committee – Government substream, May 2024 – present.
- ErSE program review committee, Jan 2024 – Jun 2024.
- ErSE faculty hiring committee, Jan 2024 – present.
- Member of the KAUST Sustainability Working Group (SWG), Mar 2021 – present.
- Member of the Climate and Livability Initiative hiring committee, Aug 2021 – Dec 2023.
- Chair of the Atmospheric Aerosols Modeling faculty hiring committee, July 2022 – June 2023.
- Member of the working Committee for the development of the joint NEOM-KAUST Red Sea Exploration and Conservation Research Center, Feb 2021 – Dec 2023.
- Member of Committee on Acquisition of Supercomputing Facilities (CASF), Nov 2020 – Jun 2023.
- Chair of the Climate Data Analysis faculty hiring committee, Jan 2021 – Jul 2021.
- Chair of the Earth Fluid faculty hiring committee, Fall 2017 – 2019.
- ErSE Mentor Lead KGSP students program, Fall 2015 – 2019.
- Chair of the ErSE students admission committee, Fall 2014 – Fall 2016.
- Extreme Computing Center faculty hiring committee, 2014 – 2016.
- High performance computational resources allocation committee (RAC), 2010 – 2016.
- AMCS and CS faculty hiring committees, 2013 – 2014.
- ErSE students admission committee, 2013 – 2014.
- Organizer of the ErSE seminar series, 2013.
- ErSE faculty hiring committee, 2011 – 2013.
- MCSE representative in the students benefits task force, March – September 2012.
- Faculty advisor of KAUST's SPE student chapter, 2010 – 2013.
- MCSE representative in the students recruitment/admission task force, Fall 2011.
- ErSE students advising committee, 2009 – 2011.
- AMCS students advising committee, Fall 2010 – 2011.
- MarSE faculty hiring committee, 2009 – 2011.
- ErSE students admission committee, 2009 – 2011.
- MarSE students admission committee, 2009 – 2010.
- Classrooms equipment and IT resources committee, 2009 – 2010.
- Ph.D. thesis defense committees of Maojin Gong (ME, 2024); Gaurav Gairola (ErSE, Nov 2024); Jefferson Riera (ErSE, Sep 2024); Gaukhar Shaimerdenova (AMCS, My 2024); Hasnaa Zahrani (AMCS, Jan 2023); Matthew Tietbohi (MarSE, Nov 2022); Abdulrahman Mohammed (ME, Apr 2022); Saja Almohammadi

- (AMCS, Nov2021); Tao Zhang (ErSE, Mar 2021); Andika Perbawa (ErPE, Feb 2021); Sebastian Overmans (MarSE, Nov 2020); Michael Campbell (MarSE, Nov 2020); Myrto Galanopoulou (AMCS, Nov 2020); Chao Song (ErSE, Nov 2020); Yongwei Wang (ME, Jun 2020); Sultan Barakati (AMCS, Jun 2020); Qiang Guo (ErSE, Feb 2020); Zhen-dong Zhang (ErSE, Oct 2019); Ghada Sindi (ErSE, Nov 2018); Nicholas Zarokanellos (MarSE, May 2018); Nabil Masmoudi (ErSE, May 2018); Veronica Chaidez (MarSE, April 2018); Oliver Lopez (EnSE, Feb 2018); Khaled Asfahani (MarSE, Oct 2017); Ramzi Djebbi (ErSE, Aug 2017); Abdulla Desmal (EE, Jan 2016); Lakshmi Selvakumaran (ME, Dec 2015); Ardiansyah Negara (ErSE, Apr 2015); Hoby Razafindrakoto (ErSE, Mar 2015); Perdana Karim (MarSE, Nov 2014); Thomas Höllt (AMCS, Apr 2013); Jessica Bouwmeester (MarSE, Dec 2013); Gerrit Nanninga (MarSE, Sep 2013).
- M.Sc. thesis defense committees of Yuanyuan Yang (ErSE, Nov 2021); Jefferson Riera (CEMSE, Mar 2020); Lyndsey Tanabe (MarSE, Nov 2018); Aislinn Dune (MarSE, May 2018); Zhuldyzav Baki (AMCS, Apr 2018); Pablo Martinez (ErSE, May 2016); Arturo Jimenez (ErSE, May 2016); Mohamed Suliman (EE, May 2016); Hanchen Wang (ErSE, Apr 2016); Zhendong Zhang (ErSE, Apr 2016); Dias Urozayev (ErSE, Jun 2015); Nabil Masmoudi (ErSE, May 2014); Ali Al-Dawood (ErSE, May 2012); Ammar Radwan (AMCS, Sep 2011); Hossam Osman (ErSE, May 2011).

JOURNALS PAPERS AND BOOKS CHAPTERS

1. E. Sullivan, N. Papagiannopoulos, D. Clewley, S. Groom, D. Raitsos, and **I. Hoteit**: *Mapping coastal marine habitats using UAV and multispectral satellite imagery in the NEOM region, northern Red Sea*. Remote Sensing, accepted, 2025.
2. M. Saharwardi, H. Dasari, W. Hassan, H. Gandham, R. Pathak, M. Zampieri, K. Ashok and **I. Hoteit**: *Projected increase in droughts over the Arabian Peninsula and associated uncertainties*. Submitted to Scientific Reports, accepted, 2025.
3. Y. Wang, M. Mazloff, A. Verdy, I. Ceroveck, G. Krokos, P. Naylor, and **I. Hoteit**: *Observations and biogeochemical modelling reveal chlorophyll diel cycle with near-sunset maxima in the Red Sea*. Global Biogeochemical cycles, accepted, 2025.
4. D. Govardhan, R. Pathak, A. Karumuri, and **I. Hoteit**: *Midlatitude circulations linked to seasonal extreme precipitation and maximum surface temperature events in the Arabian Peninsula*. Climate Dynamics, accepted, 2025.
5. M. Pateraki, D. Raitsos, G. Krokos, I. Theodorou, and **I. Hoteit**: *Unravelling the influence of mixed layer depth on chlorophyll-a dynamics in the Red Sea*. PLoS One, accepted, 2025.
6. I. Lakkis, A. Rustom, A. Hammoud, L. Issa, O. Knio; O. Le Maitre, and **I. Hoteit**: *Identification of moving sources in stochastic flow fields: A Bayesian inferential approach with application to marine traffic in the Mediterranean Sea*. Computational Geosciences, accepted, 2024.
7. A. Hammoud, E. Titi, **I. Hoteit**, and O. Knio: *Downscaling using 4under observational and model noises: The Rayleigh-Benard convection paradigm*. Computational Geosciences, accepted, 2024.
8. E. Gokul, D. Raitsos, R. Brewin, and **I. Hoteit**: *Remotely-sensing coral bleaching in the Red Sea*. Remote Sensing in Ecology and Conservation, accepted, 2024.
9. C. Antony, S. Langodan, and **I. Hoteit**: *Extreme sea-level probabilities in the Red Sea: Present and future perspectives*. Ocean Engineering, accepted, 2024.
10. U. Saharan, T. Mandal, S. Sharma, S. Singh, S. Ahlawat, N. Jangir, J. Singh, R. Kumar, and **I. Hoteit**: *An evaluation of control strategies using multimodal analysis of PM2.5 in Delhi, India*. ACS Environmental Science and Technology Air, accepted, 2024.
11. E. Fanjul et al.: *Promoting best practices in ocean forecasting through an operational readiness level*. Frontiers in Marine Science, accepted, 2024.
12. W. Hassan, M. Nayak, S. Saharwardi, J. Dar, H. Dasari, **I. Hoteit**, and Y. AbuAlnaja: *Unveiling the devastating effect of the Spring 2022 mega-heatwave on South Asian snowpack*. Communications Earth and Environment, accepted, 2024.

13. R. Thiruridathil, H. Dasari, A. Alduwais, R. Karumuri, V. Srinivas, and **I. Hoteit**: *Performance of PALM-4U/WRF model for simulating the urban meteorology of King Abdullah University of Science and Technology (KAUST), Saudi Arabia*. Urban Climate, accepted, 2024.
14. D. Guo, P. Zhan, J. Ma, P. Vasou, G. Krokos, H. Alghamdi, and **I. Hoteit**: *Seasonal variation and fundamental characteristics of baroclinic tides in the Arabian Gulf*. Frontiers in Marine science, accepted, 2024.
15. K. Sreejith, S. Sarma, P. Sreenivas, F. Feba, **I. Hoteit**, and A. Karumuri: *Seasonal intensification of Oxygen minimum zone: Linking Godavari river discharge to fall Hypoxia in the Bay of Bengal*. Frontiers in Marine Science, accepted, 2024.
16. J. V. Ratnam, S. Behera, **I. Hoteit**, and T. Doi: *Predicting monthly precipitation in the wet season over Saudi Arabia using seasonal prediction systems*. Weather and Forecasting, accepted, 2024.
17. M. Zampieri, A. Karumuri, A. Toreti, D. Bavera, and **I. Hoteit**: *On the stationarity of the global spatial dependency of heat risk on drought*. Geophysical Research Letters, accepted, 2024.
18. F. Chu, X. Yu, K. George, **I. Hoteit**, K. Asfahani, and P. Zhan: *Submesoscale processes in the northern Red Sea: Insights from underwater glider observations*. Journal of Geophysical Research, accepted, 2024.
19. S. Saharwardi, H. Dasari, H. Gandham, K. Ashok, and **I. Hoteit**: *Spatiotemporal variability of hydro-meteorological droughts over the Arabian Peninsula and associated mechanisms*. Scientific Reports, accepted, 2024.
20. R. Sun, S. Sanikommu, A. Subramanian, M. Mazloff, B. Cornuelle, G. Gopalakrishnan, A. Miller and **I. Hoteit**: *Enhanced regional ocean ensemble data assimilation through atmospheric coupling in the SKRIPS model*. Journal of Ocean Modeling, accepted, 2024.
21. A. Hammoud, N. Raboudi, E. Titi, O. Knio, and **I. Hoteit**: *Data assimilation in chaotic systems using deep reinforcement learning*. Journal of Advances in Modeling Earth Systems, accepted, 2024.
22. M. Hamdeno, A. Alvera-Azcárate, G. Krokos, and **I. Hoteit**: *Investigating the long-term variability of the Red Sea marine heatwaves and their relationship to different climate modes: focus on 2010 events in the northern basin*. Ocean Science, 20, 1087–1107, 2024.
23. R. Kunchala, R. Attada, R. Karumuri, V. Seelanki, B. Singh, K. Ashok, and **I. Hoteit**: *Climatology, trends and future projections of aerosol optical depth over the Middle East and north Africa region in CMIP6 models*. Frontiers in Climate, accepted, 2024.
24. S. Sanikommu, S. Langodan, N. Raboudi, P. Zhan, G. Krokos, M. Gharamti and **I. Hoteit**: *Insights from very large ensemble data assimilation experiments with a high-resolution general circulation model of the Red Sea*. Quarterly Journal of the Royal Meteorological Society, accepted, 2024.
25. A. Alduwais, H. Dasari, R. Karumuri, H. Gandham, K. Vankayalapati, M. Saharwardi, A. Karumuri, and **I. Hoteit**: *Spatiotemporal variability of surface ozone and associated meteorological conditions over the Arabian Peninsula*. Atmospheric Pollution Research, accepted, 2024.
26. R. Karumuri, H. Dasari, H. Gandham, R. Kunchala, R. Attada, K. Ashok, and **I. Hoteit**: *Investigation of dust-induced direct radiative forcing over the Arabian Peninsula based on high-resolution WRF-Chem simulations*. Geophysical Research, accepted, 2024.
27. T. Luong, H. Dasari, Q.-V. Doan, A. Alduwais, and **I. Hoteit**: *Organized precipitation and associated large-scale circulation patterns over the Kingdom of Saudi Arabia*. International Journal of Climatology, accepted, 2024.
28. M. Zampieri, T. M. Luong, K. Ashok, H. Dasari, A. Pistocchi, and **I. Hoteit**: *Leveraging atmospheric moisture recycling in Saudi Arabia and neighboring countries for irrigation and afforestation planning*. Regional Environmental Change, accepted, 2024.
29. K. Zeng, E. Gokul, H. Gu, **I. Hoteit**, and P. Zhan: *Spatiotemporal expansion of harmful algal blooms in coastal China Seas*. Environmental Science and Technology, accepted, 2024.

30. S. El-Mohtar, O. Le Maitre, O. Knio, and **I. Hoteit**: *Iterative data-driven construction of surrogates for an efficient Bayesian identification of oil spill source parameters from image contours*. Computational Geosciences, accepted, 2024.
31. H. Mittal, M. Hammoud, A. Carrasco, **I. Hoteit**, and O. Knio: *Oil spill risk analysis for the NEOM shoreline*. Scientific Reports, accepted, 2024.
32. R. Larayedh, B. Cornuelle, G. Krokos, and **I. Hoteit**: *Numerical investigation of shipping noise in the Red Sea*. Scientific Reports, 14, 5851, 2024.
33. F. Liao, K. Yang, P. Zhan, and **I. Hoteit**: *Future change in Vietnam upwelling under a high-emission scenario*. Geophysical Research Letters, accepted, 2024.
34. K. Kikaki, I. Kakogeorgiou, **I. Hoteit**, and K. Karantzalosa: *Detecting marine pollutants and sea surface features with deep learning in sentinel-2 imagery*. ISPRS Journal of Photogrammetry and Remote Sensing, <https://doi.org/10.5281/zenodo.10664073>, 2024.
35. G. Krokos, I. Cerovečki, P. Zhan, M. C. Hendershott, and **I. Hoteit**: *Seasonal variability of Red Sea mixed layer depth: the influence of atmospheric buoyancy and momentum forcing*. Frontiers in Marine Science, 11, doi: 10.3389/fmars.2024.1342137, 2024.
36. E. Al-Awar, M. Hammoud, and **I. Hoteit**: *Two-step AI-aided Bayesian source identification of urban-scale pollution*. Atmospheric Environment, 323, <https://doi.org/10.1016/j.atmosenv.2024.120388>, 2024.
37. L. Howard, A. Subramanian, and **I. Hoteit**: *A machine learning augmented data assimilation method for high-resolution observations*. Advances in Modeling Earth Systems <https://doi.org/10.1029/2023MS003774>, 2024.
38. T. Zhang, Y. Zhang, K. Katterbauer, A. Al-Shehri, S. Sun, and **I. Hoteit**: *Deep learning-assisted phase equilibrium analysis for producing natural hydrogen*. International Journal of Hydrogen Energy, 50, 473-486, 2024.
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