

# OCEAN **CARBON** AND BIOGEOCHEMISTRY IN **TROPICAL SEAS**



**KAUST VIRTUAL RESEARCH CONFERENCE APRIL 6-8, 2021**

# **AGENDA**

# ABOUT

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[cflux.kaust.edu.sa](http://cflux.kaust.edu.sa)

To date, most efforts to quantify global carbon fluxes have focused on high latitude temperate and polar regions. The conference will address the different components of the carbon pump, discuss what challenges remain in identifying and quantifying these pumps, and evaluate integrated, state-of-the-art observational and modeling approaches to resolving processes under extreme conditions, specifically in the tropical ocean.

Because KAUST has the Red Sea, one of the warmest oligotrophic seas, at its doorstep, it provides a natural laboratory for studying these processes in what likely characterizes the future tropical ocean. Thus, it offers opportunities to study the fate of organic carbon under these extreme conditions.

The goal of the conference is to gain a better understanding of the biological carbon pump's major components, taking into consideration their multiple drivers.

## Organizing committee members:

**Prof. Burton Jones**

**Dr. Malika Kheireddine**

**Aislinn Dunne**

**Prof. Xosé Anxelu G. Morán**

**Dr. Anders Rostad**

**Christine Nelson**

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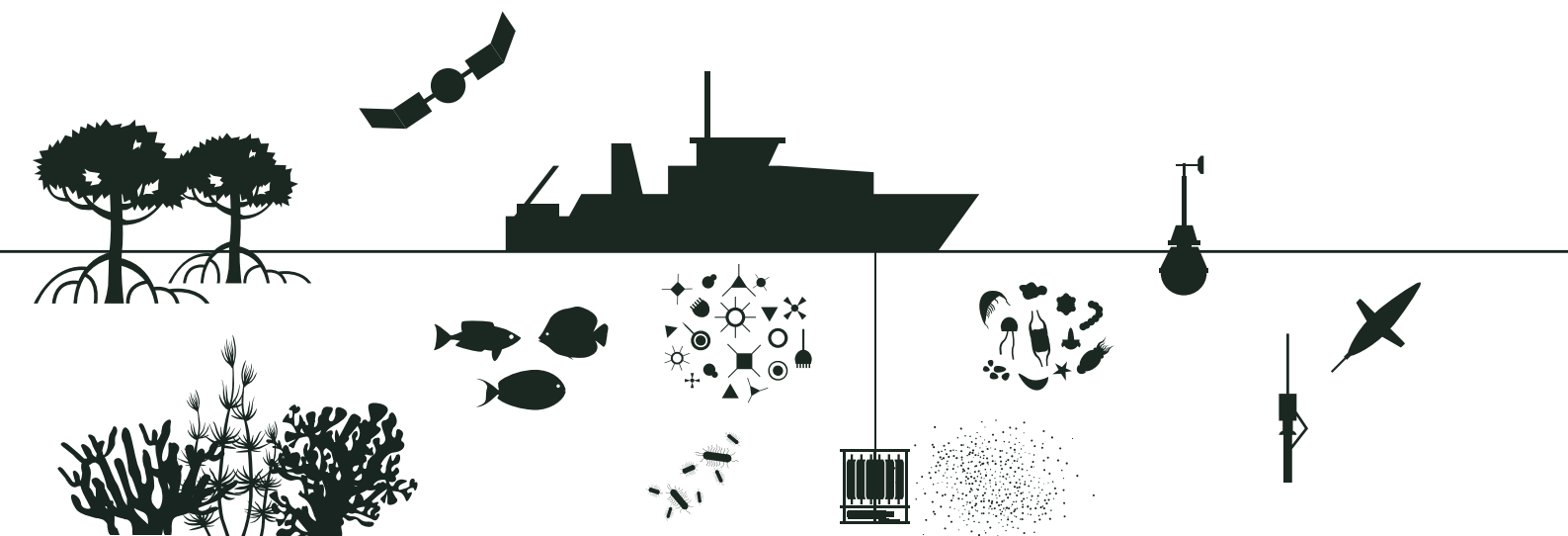
[malika.kheireddine@kaust.edu.sa](mailto:malika.kheireddine@kaust.edu.sa)

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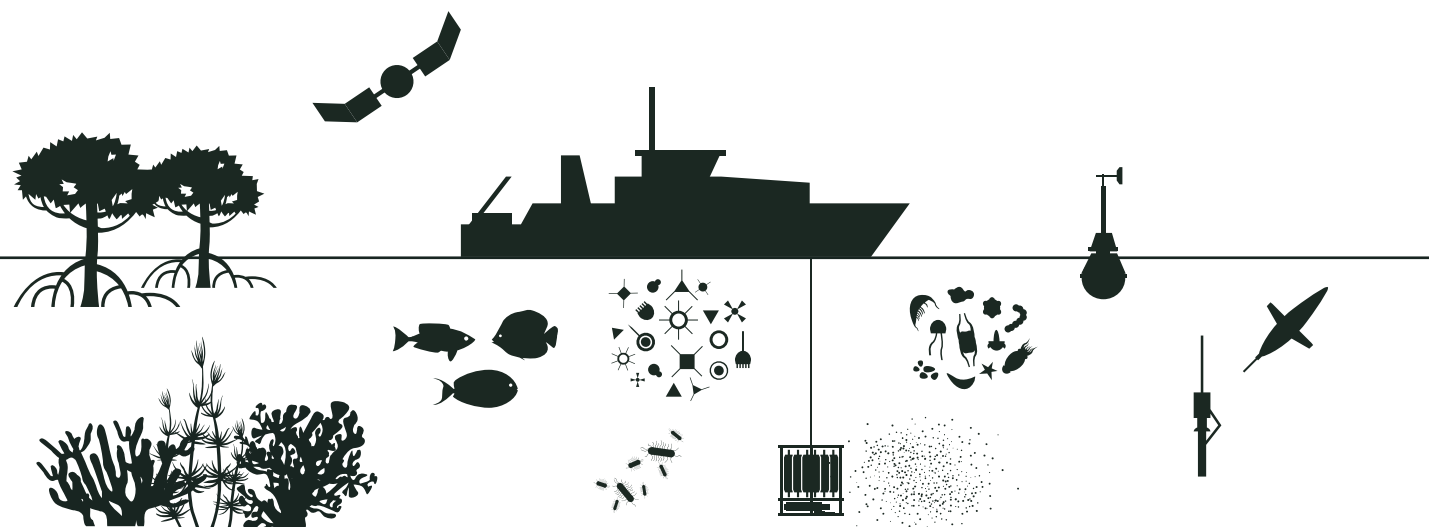


## Agenda (details)

### Tuesday, 6 April - Research conference

#### *Morning session*

- 08:30 - 08:50** Welcome and opening remarks  
**Prof. Michael Berumen, KAUST, KSA**
- 08:50 - 09:10** Overview of the conference  
**Prof. Burton Jones, KAUST, KSA**
- 09:10 - 09:45** **Keynote lecture:** The strategic objectives and initiatives for National Center for Wildlife  
**Prof. Mohammed Qurban, National Center for Wildlife Development, KSA**
- 09:45 - 10:05** Establishing Integrated and Interdisciplinary Observations to Inform Biodiversity Enhancement and Carbon Neutrality for The Red Sea Project  
**Dr. Rusty Brainard, TRSDC/KAUST, KSA**
- 10:05 - 10:15** Assessment of carbon sequestered in mangrove forests within the Red Sea project area  
**Dr. Susann Rossbach, TRSDC, KSA**
- 10:15 - 10:30** BREAK: Kids vision
- 10:30 - 11:10** **Keynote lecture:** Carbon exports and losses processes in Tropical Seas: a study case in the Red Sea  
**Dr. Malika Kheireddine, KAUST, KSA**
- 11:10 - 11:35** Bulk and export production fluxes in the Gulf of Aqaba, northern Red Sea  
**Prof. Adi Torftein, Hebrew University of Jerusalem, Israel**
- 11:35 - 11:45** Carbon stocks in the central Red Sea  
**Mustapha Ouhssain, KAUST, KSA**



11:45 - 14:00

BREAK

*Afternoon session*

14:00 - 14:40

**Keynote lecture:** Robotic exploration of carbon fluxes in the tropical ocean  
**Dr. Hervé Claustre**, Laboratoire d'Océanographie de Villefranche (LOV), France

14:40 - 14:50

Enhanced Winter Carbon Export Observed by BGCargo in the Northwest Pacific Ocean  
**Dr. Xiaogang Xing**, Second Institute of Oceanography/ Ministry of Natural Resources, China

14:50 - 15:10

Application of mobile autonomous platforms for Biogeochemical studies  
**Prof. Craig Lee**, University of Wahsington, USA

15:10 - 15:20

BREAK: Kids vision

15:20 - 15:55

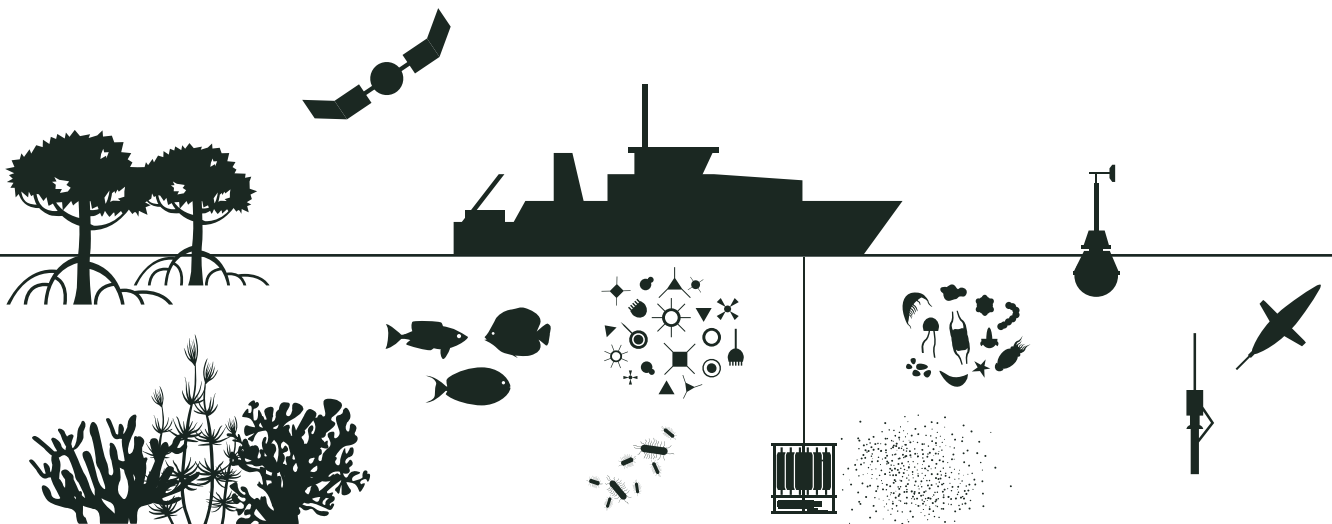
**Keynote lecture:** Assessing Ocean Carbon Export Pathways & Their Impacts With a Focus on the Tropical Ocean  
**Prof. Dave Siegel**, University of California, Santa Barbara, USA

15:55 - 16:05

Estimating mass flux of particles from the measurements of angular scattering  
**Prof. Xiaodong Zhang**, The University of Southern Mississippi, USA

16:05 - 16:30

An overview of the European Space Agency project Biological Pump and Carbon Exchange Processes  
**Dr. Robert Brewin**, University of Exeter, UK

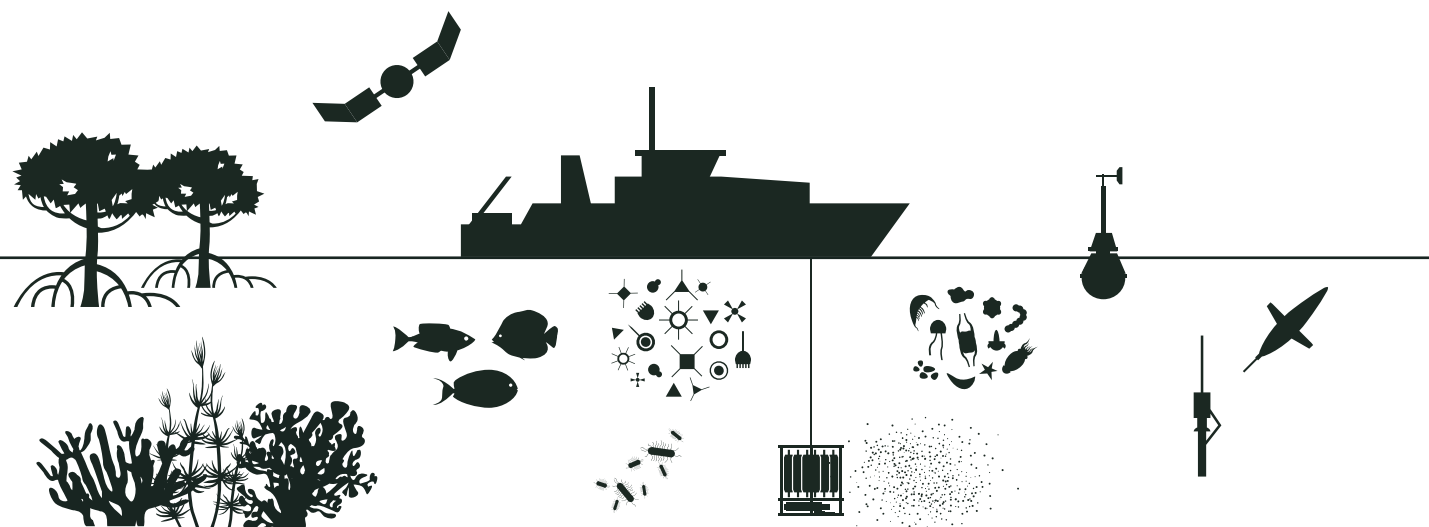


## Agenda (details)

### Wednesday, 7 April - Research conference

#### *Morning session*

- 08:30 - 09:05**      **Keynote lecture:** The Arabian Sea oxygen minimum zone: recent trends and vulnerability to climate change  
**Dr. Zouhair Lachkar**, NYU Abu Dhabi, UAE
- 09:05 - 09:15**      Production of dissolved organic carbon in the South China Sea: A modeling study  
**Dr. Wentao Ma**, Second Institute of Oceanography/ Ministry of Natural Resources, China
- 09:15 - 09:30**      Quantifying the atmospheric CO<sub>2</sub> forcing effect on surface ocean pCO<sub>2</sub> in the North Pacific subtropical gyre in the past two decades  
**Prof. Shuangling Chen**, Second Institute of Oceanography/ Ministry of Natural Resources, China
- 09:30 - 10:05**      **Keynote lecture:** Biogeochemical fluxes mediated by heterotrophic prokaryotes in the tropical ocean and the role of advected DOM  
**Prof. Xosé Anxelu G. Morán**, Spanish Institute of Oceanography (IEO), Spain  
KAUST, KSA
- 10:05 - 10:25**      Further evidence of a mesopelagic DOM hotspot for heterotrophic prokaryotes in the central Red Sea  
**Dr. Syed Haleem Shah**, KAUST, KSA
- 10:25 - 10:45**      Bacterial consumption of total and dissolved organic carbon in the great barrier reef  
**Dr. Catia Carreira**, Aarhus University, Denmark
- 10:45 - 11:00**      BREAK: Kids vision



11:00 - 11:10

Organic matter as an active component of biogeochemical cycles in tropical waters

**Dr. Christian Lønborg**, Aarhus University, Denmark

11:10 - 11:45

**Keynote lecture:** Mesopelagic carbon flows and budgets in tropical regions

**Dr. Sarah L.C. Giering**, National Oceanography Centre Southampton, UK

11:45 - 12:05

Carbon fluxes and biogeochemical responses caused by tropical cyclones in the South China Sea

**Prof. Chin-Chang Hung**, National Sun Yat-sen University, Taiwan

12:05 - 14:00

BREAK

*Afternoon session*

14:00 - 14:20

Biogeochemical cycling of Urea in the Tropical Indian Ocean

**Prof. Peter Croot**, National University of Ireland Galway, Ireland

14:20 - 14:40

Total alkalinity production in a mangrove ecosystem reveals an overlooked Blue Carbon component

**Dr. Vincent Saderne**, KAUST, KSA

14:40 - 15:00

Coral-algal phase shifts alter carbon cycling in contemporary coral reefs

**Dr. Florian Roth**, Stockholm University, Sweden

15:00 - 15:10

BREAK: Kids vision

15:10 - 15:30

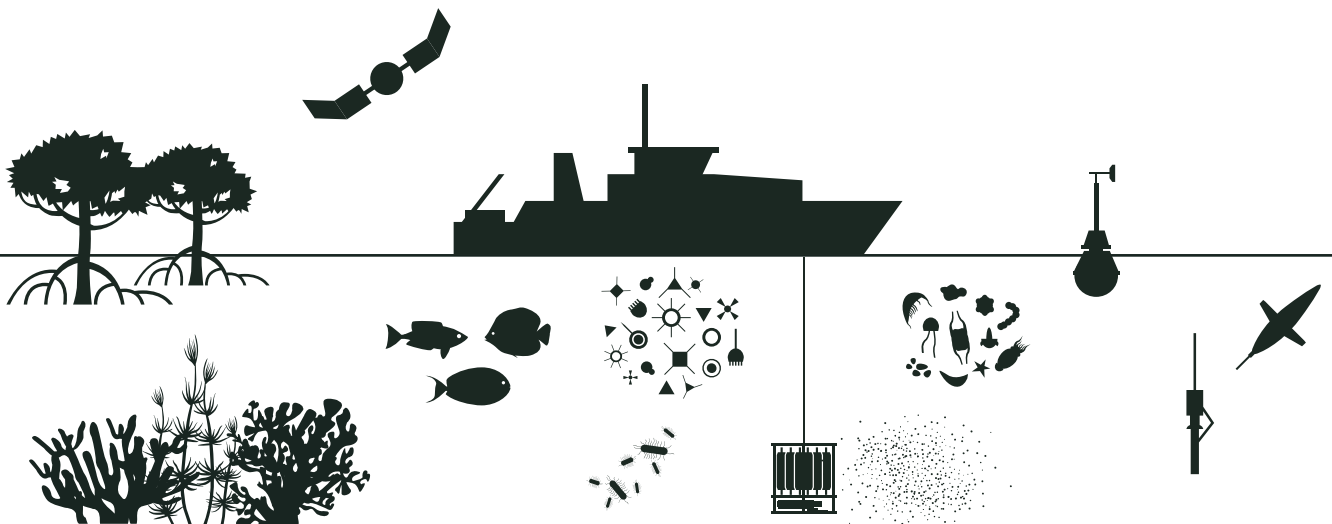
Herbivorous fish feeding as a vector of organic matter to coral reefs

**Aislinn Dunne**, KAUST, KSA

15:30 - 16:00

**Keynote lecture:** Mesopelagic fish in tropical waters (Issues for estimating vertical carbon transport)

**Prof. Stein Kaartvedt**, University of Oslo, Norway





## Agenda (details)

### Thursday, 8 April - Research conference

#### *Morning session*

- 09:00 - 09:10** Carbon, the Sea, You and Me! (Song)  
**Michelle-Nicole Havlik, KAUST, KSA**
- 09:10 - 09:30** Outreach: Why do we observe the Ocean?  
**Dr. Malika Kheireddine, KAUST, KSA**
- 09:30 - 09:45** BREAK: Kids vision
- 09:45- 12:00** Break until the live session

#### *Afternoon session*

- 12:00 - 14:00** **Live session on Zoom:** Discussion about the major questions related to carbon fluxes in tropical seas, what are the challenges, and approaches to resolving the processes involved.

