



surface ocean **solas** lower atmosphere study  
2011



# Summer School

## 2011



29 August - 10 September 2011

Cargèse, Corsica

Organised by:

Véronique Garçon, CNRS/CNES/UPS, LEGOS, Toulouse, France  
SOLAS International Project Office, IFM-GEOMAR, Kiel, Germany  
SOLAS Nodal Office, University of East Anglia, Norwich, UK

## Welcome

Dear Participants,

Bienvenue and welcome to the 5th International SOLAS Summer School.

Held amongst the beautiful scenery of the western coast of Corsica, you are joining a group of students, and long line of alumni, who have the opportunity to learn from and share their science with some of SOLAS's greatest scientists.

With a plethora of lecture topics, practicals, special sessions and student activities, the format of the Summer School is constructed to give you a wide scope of SOLAS science to add value to and embellish your knowledge of your study discipline.

Attending this Summer School can thrust you into the spotlight of the SOLAS community: Included within the programme are student poster sessions and presentations where winners are presented in the next issue of the SOLAS newsletter; previous attendees can be invited to write articles for the SOLAS newsletter; and, you may even find yourself back here as a lecturer or demonstrator like Eric Galbraith, Aurélien Paulmier, Roland von Glasow (Summer School students 2003) or Rachael Beale (Summer School student 2009).

Take this opportunity to arrive as peers and leave with good friends, good memories and international contacts for future collaborations.

We hope you enjoy the experience,

**Véronique Garçon**

SOLAS Summer School Co-ordinator

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## SOLAS - The Surface Ocean-Lower Atmosphere Study

SOLAS international research initiative comprising of over 1900 scientists in 75 countries with an International Project Office, based in Kiel, Germany, and a Nodal Office in Norwich, UK, whose staff communicate with and co-ordinate research teams across the globe. The project's primary objective is:

*"to achieve quantitative understanding of the key biogeochemical-physical interactions and feedbacks between the ocean and atmosphere, and of how this coupled system affects and is affected by climate and environmental change."*

Achievement of this goal is important in order to understand and quantify the role that ocean-atmosphere interactions play in the regulation of climate and global change.

FOR MORE INFORMATION, PLEASE VISIT <http://www.solas-int.org/aboutsolas/aboutsolas.html>

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# L'INSTITUT D'ETUDES SCIENTIFIQUES DE CARGÈSE (The Institute for Scientific Studies of Cargèse)

## HISTORY

The Institute started in the 1960s as an independent, non-profit association in 'Villa Menasina' under the direction of Maurice Levy, an eminent theoretical physicist. Since 1996, the Institute has become a CNRS unit; a National Centre for Scientific Research under the administrative authority of France's Ministry of Research. A progressive broadening of subjects and activity ensued under the direction of Elisabeth Dubois Violette, who cultivated the all-year sequence of events in all scientific fields.

## LOGISTICS

### Internet

A computer room is available for your use. Wi-fi is available on-site. You will be given a password to access the internet upon arrival.

### Meals

- ▶▶ Breakfast: Breakfast is ONLY available for students with accommodation at the Institute and a continental breakfast will be served from 7.30am in the dining room. Students staying in the village will have to organise their own breakfasts (see 'Local Information > Supermarket).
- ▶▶ Lunch: On working days (excluding the rest day, Sunday 4 September), lunch is served at the Institute at 12noon prompt and without delay.
- ▶▶ Supper: A BBQ dinner will be served on Tuesday 30 September, at the Institute, but **no other dinners will be provided.**

### Rest Day

An optional trip to the Scandola Reserve will be organised by the IPO staff for the rest day. More information will be made available on-site.

## LOCAL INFORMATION

### Currency + Banking

The local currency is the Euro, €. A currency calculator can be found at: <http://www.xe.com/ucc/>. There are cash points outside the supermarket and the post office.

### Restaurants

You should expect to pay about 20€ for a simple meal and soft drink in most of the local restaurants.

### Supermarket

The supermarket opens at 7.30am-12noon and 3pm-7pm.

### Emergency Numbers

Institute +33 (0) 632 60.40.95  
Vero +33 (0) 679 04.85.81

Kath +44 (0) 7785 70.07.16  
Emilie +33 (0) 663 01.39.47

FOR MORE INFORMATION, PLEASE VISIT <http://www.cargese.net/fr/>

Figure 1: Map of the Institute

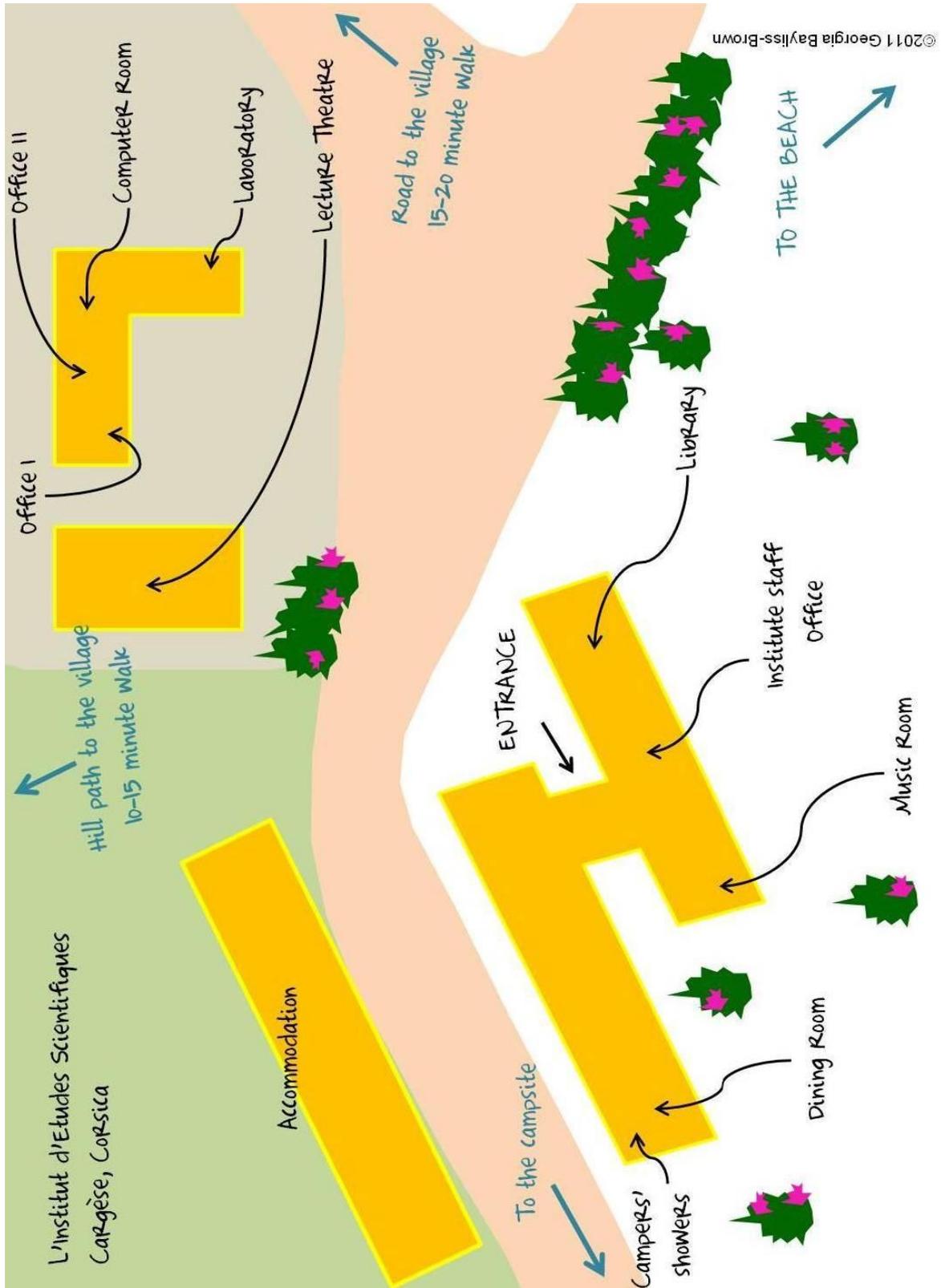
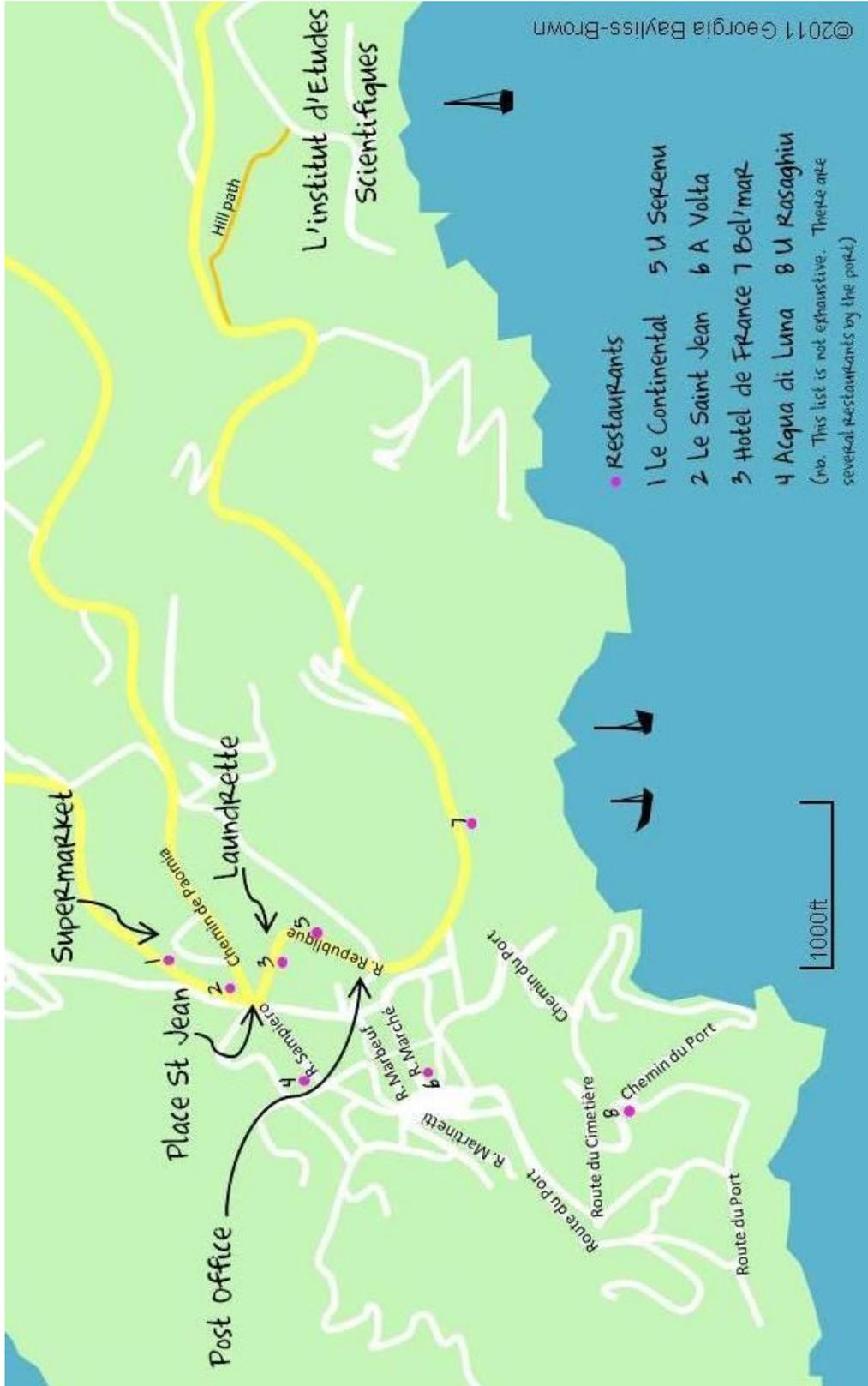
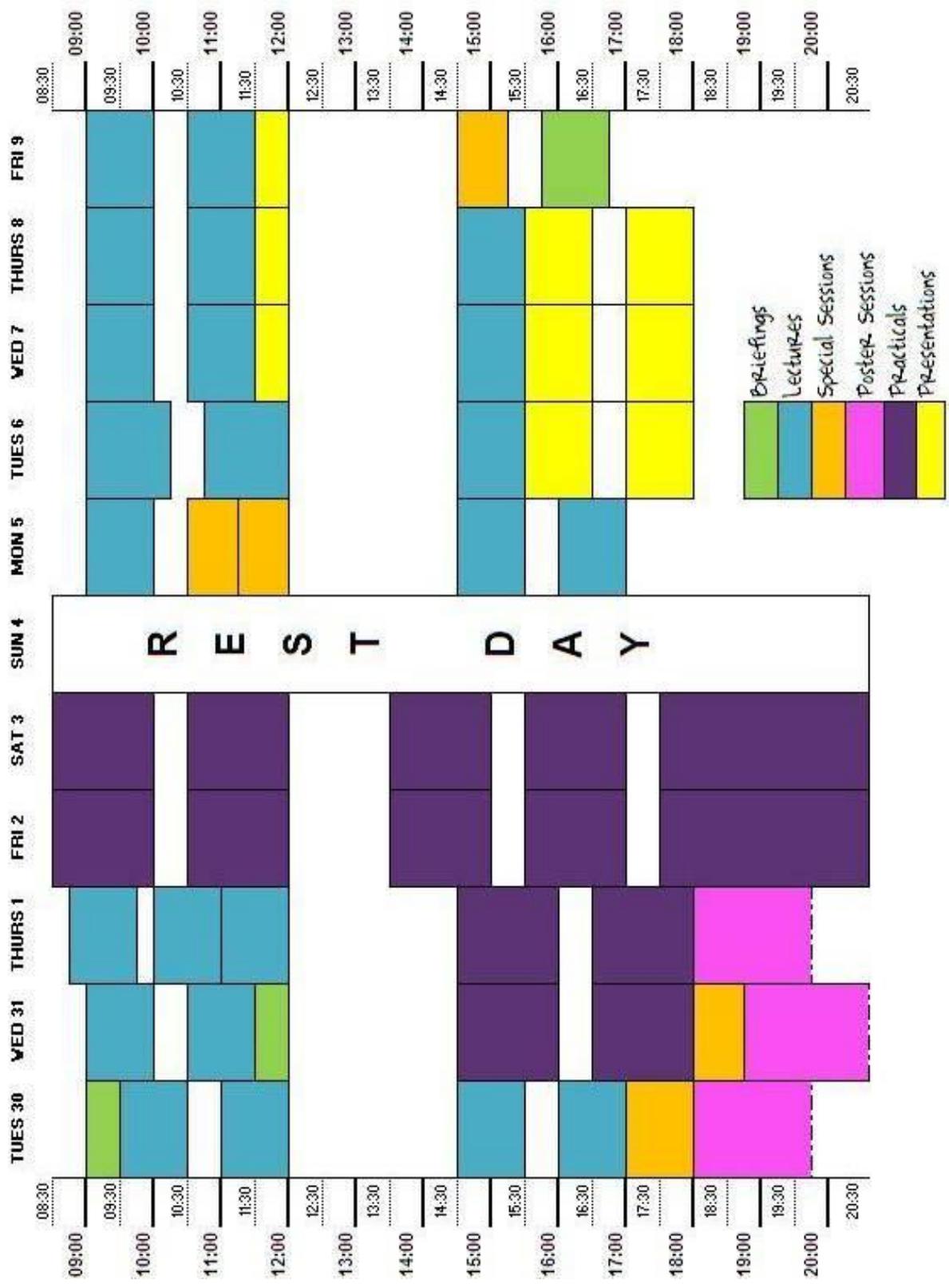


Figure 2: Map of the local area



# TIMETABLE



## SCHEDULE

<b>Day 1</b>	<b>Monday 29 Aug</b>	
	Arrival and registration	
<b>Day 2</b>	<b>Tuesday 30 Aug</b>	
9:00	Welcome to the Institut of Cargese	Pierre-Eric Grossi
9:10	Welcome to the SOLAS summer school	Véronique Garçon
	Introduction to SOLAS	Véronique Garçon
9:30	Greenhouse gases and climate change	Laurent Bopp
10:30	Coffee break	
11:00	Marine ecology I: Phytoplankton and primary production	Maurice Levasseur
12:00	Lunch	
14:30	Trace gases in ocean and atmosphere	Peter Liss
15:30	Coffee break	
16:00	Air-water gas exchange I	Phil Nightingale
17:00	Special Session: What is excellent Science?	Juergen Weichselgartner
18:00	Poster session I	Participants (see 'Poster session list')
20:00	<b>BBQ Welcome Dinner</b>	
<b>Day 3</b>	<b>Wednesday 31 Aug</b>	
9:00	The global carbon cycle	Laurent Bopp
10:00	Coffee break	
10:30	Atmospheric modelling	Roland von Glasow
11:30	Practical workshop briefings	Practicals leaders
12:00	Lunch	
14:30	Practical session (Wed PM)	See 'Practical Allocations'
16:00	Coffee break	
16:30	Practical session (Wed PM)	
18:00	Special Session: The IPCC process	Corinne Le Quéré
18:45	Poster session II	Participants (see 'Poster session list')
<b>Day 4</b>	<b>Thursday 1 Sept</b>	
8:45	Marine ecology II: Bacterioplankton, respiration and other microbial processes	Maurice Levasseur
9:45	Coffee break	
10:00	Air-water gas exchange II	Phil Nightingale
11:00	Introduction to ocean physics	Alberto Piola
12:00	Lunch	
14:30	Practical session (Thurs PM)	See 'Practical Allocations'
16:00	Coffee break	
16:30	Practical session (Thurs PM)	
18:00	Poster session III	Participants (see 'Poster session list')

Day 5 Friday 2 Sept		
7:10	Cruise practical session collection (Fri AM)	See 'Practical Allocations'
8:30	Practical session (Fri AM)	See 'Practical Allocations'
10:00	Coffee break	
10:30	Practical session (Fri AM)	
12:00	Lunch	
13:30	Practical session (Fri PM)	See 'Practical Allocations'
15:00	Coffee break	
15:30	Practical session (Fri PM)	
17:30	Practical session (Fri EVE)	See 'Practical Allocations'

Day 6 Saturday 3 Sept		
7:10	Cruise practical session collection (Sat AM)	See 'Practical Allocations'
8:30	Practical session (Sat AM)	See 'Practical Allocations'
10:00	Coffee break	
10:30	Practical session (Sat AM)	
12:00	Lunch	
13:30	Practical session (Sat PM)	See 'Practical Allocations'
15:00	Coffee break	
15:30	Practical session (Sat PM)	
17:30	Practical session (Sat EVE)	See 'Practical Allocations'

Day 7 Sunday 4 Sept		
09:10	Cruise practical session collection (Sun DAY)	See 'Practical Allocations'
	All other students – Rest Day	

Day 8 Monday 5 Sept		
9:00	Climate change and variability	Alberto Piola
10:00	Coffee break	
10:30	Special Session: Ethics in science	Eric Saltzman
11:15	Special Session: Organisation of science	Emilie Brévière
12:00	Lunch	
14:30	Atmospheric chemistry I	Maria Kanakidou
15:30	Coffee break	
16:00	Remote sensing I	Mike Behrenfeld

Day 9 Tuesday 6 Sept		
9:00	The iron cycle	Phil Boyd
10:15	Coffee break	
10:45	Marine genomics	Phyllis Lam
12:00	Lunch	
14:30	Introduction to marine aerosols	Eric Saltzman
15:30	5 min oral presentations	Participants
16:30	Coffee break	
17:00	5 min oral presentations	Participants

<b>Day 10 Wednesday 7 Sept</b>		
9:00	Remote sensing II	Mike Behrenfeld
10:00	Coffee break	
10:30	Macronutrients in the ocean	Phil Boyd
11:30	5 min oral presentations	Participants
12:00	Lunch	
14:30	Atmospheric and oceanic time series observations	Eric Saltzman & Phil Boyd
15:30	5 min oral presentations	Participants
16:30	Coffee break	
17:00	5 min oral presentations	Participants
<b>Day 11 Thursday 8 Sept</b>		
9:00	Processes in the coastal zone: Biogeochemistry & hydrology I	KK Liu
10:00	Coffee break	
10:30	Biogeochemical changes over long time-scales	Eric Galbraith
11:30	5 min oral presentations	Participants
12:00	Lunch	
14:30	Atmospheric chemistry II	Maria Kanakidou
15:30	5 min oral presentations	Participants
16:30	Coffee break	
17:00	5 min oral presentations	Participants
<b>Day 12 Friday 9 Sept</b>		
9:00	Oceanic biogeochemistry modelling	Véronique Garçon
10:00	Coffee break	
10:30	Processes in the coastal zone: Biogeochemistry & hydrology II	KK Liu
11:30	Practical sessions' report	Participants
12:00	Lunch	
14:30	Special Session: Scientists and the press	Phil Boyd
15:15	Coffee break	
15:45	Closure speech	Véronique Garçon
<b>Day 13 Saturday 10 Sept</b>		
	Departure	

## PRACTICALS

### *Cruise 'Cruise' hosted by Véronique Garçon, Aurélien Paulmier, Lionel Fichen and Lionel Scouarnec*

You will spend half a day aboard the French research vessel Thethys II. You will collect water samples at one CTD station using a rosette and Niskin bottles. You will perform on board dissolved oxygen measurements. You will also deploy nets to sample phytoplankton and zooplankton over a given depth interval. CTD and basic meteorological measurements will be made. Back at the Institute you will measure collected samples for salinity and silicates and will examine under the microscopes the collected plankton. This practical will give you an idea of the practicalities of making basic measurements at sea. See the table below for departure times:

<b>Fri 2 Sept AM &amp; Sat 3 Sept AM</b>	07:10 Institute & 07:20 Place St Jean
<b>Fri 2 Sept PM &amp; Sat 3 Sept PM</b>	13:30 Institute
<b>Sun 4 Sept DAY</b>	09:10 Institute & 09:20 Place St Jean

Please bring the following items with you:

- ▶▶ Hat
- ▶▶ Sunglasses
- ▶▶ Sun-block
- ▶▶ Rain/Wind proof jacket
- ▶▶ Closed-toe shoes
- ▶▶ Pen and paper
- ▶▶ Drinking water

Notice: An off-site lunch will be provided for all participants who are attending the FriAM, SatAM and SunDAY.

### *Lab 'Lab' hosted by Phil Boyd, Alberto Piola and Carole Barus*

Back at the Institute, you will use microscopes to explore the wide range of marine particles from large organic aggregates to tiny phytoplankton. You will also identify some phytoplankton and zoo-plankton species. The filtrate from several depth profiles will be analysed for chlorophyll. You will also analyse water sample for salinity and nutrients. The results from all of the cruises will be synthesised into a coherent picture of the coastal sea's biogeochemistry. The Lab practical will be held in the laboratory shown on Figure 1.

Please bring the following items with you:

- ▶▶ Closed-toe shoes
- ▶▶ Pen and paper
- ▶▶ Samples from the cruise practical (if relevant)

### *Gas-Exchange 'Gasex' hosted by Peter Liss, Phil Nightingale, Andrew Dickson, Martin Johnson and Rachael Beale*

You will conduct a laboratory experiment to measure the rate at which several trace gases transfer across a sea water-air interface. In addition, you will conduct a numerical exercise illustrating several properties of the carbonate system of seawater. The Gas-Exchange practical, also known as 'Gasex' on the practical allocations sheet, will be split into three parts and held in the laboratory, the library and outside shown on Figure 1. Students should go to the library at the beginning of the practical.

Please bring the following items with you:

- ▶▶ Closed-toe shoes
- ▶▶ Pen and paper
- ▶▶ A computer with Excel and CO2calc installed

### Modelling 'Mod' hosted by Laurent Bopp

Using carbon cycle models of different complexities to illustrate the use of numerical models for different time- and space scales. The Modelling practical, also known as 'Mod' on the practical allocations sheet, will be held in the computer room shown on Figure 1.

Please bring the following items with you:

- ▶▶ Pen and paper

### Atmospheric Chemistry 'At Chem' hosted by Roland von Glasow

The modelling practical will use web-based models mainly looking at atmospheric dispersion and atmospheric chemistry. The exercises will be offered at different levels so that students new to atmospheric modelling as well as "specialists" will be able to benefit from them. The Atmospheric Chemistry practical, also known as 'At Chem' on the practical allocations sheet, will be held in Office II shown on Figure 1.

Please bring the following items with you:

- ▶▶ Pen and paper
- ▶▶ A computer with Excel and CO2calc installed

### Genomics 'Genomics' hosted by Phyllis Lam

You will work on some real data sets that examine the genetic potentials and *in situ* activities of microorganisms in marine biogeochemical cycling. Qualitative and quantitative comparison will be made with data acquired through various techniques. In addition, you will explore and decipher possible biogeochemical functions of some unknown microorganisms from (meta) genome(s). The Genomics practical will be held in the music room shown on Figure 1.

Please bring the following items with you:

- ▶▶ Pen and paper
- ▶▶ A computer with Excel, CO2calc and image software (to be confirmed) installed

### Oral and Communication 'Comms' hosted by Corinne Le Quére and Eric Saltzman

The oral and communication workshop will explain the basics of making a successful presentation. You will make a short presentation of your work to a small group and then discuss your strengths and weaknesses. The importance of body language will be discussed and tips on using PowerPoint will be provided. This will prepare you for a later presentation of your work to the whole School during your five minute presentations. The written communication workshop will involve a group discussion on the techniques for producing a successful poster, using your own poster as an example. Strategies for efficient scientific writing will also be discussed. The Oral and Communication practical, also known as 'Comms' on the practical allocations sheet, will be held in the lecture theatre shown on Figure 1.

Please bring the following items with you:

- ▶▶ Pen and paper
- ▶▶ Your poster
- ▶▶ Your 5-minute presentation
- ▶▶ Your academic paper (if relevant)

## Practical Allocations

	WedPM	ThursPM	FriAM	FriPM	FriEVE	SatAM	SatPM	SatEVE	SunDAY
Akoglu, E	Gasex	Genomic	Lab	At Chem	OFF	OFF	Comms	OFF	OFF
Anake, W	Remote	OFF	Cruise	Lab	OFF	Genomic	Comms	OFF	OFF
Andrews, O	Gasex	At Chem	Lab	OFF	Comms	OFF	Genomic	OFF	OFF
Andrews, S	Comms	Remote	Cruise	Lab	OFF	OFF	Genomic	OFF	OFF
Angelo Goncalves, I	Comms	OFF	Cruise	Lab	OFF	Genomic	Gasex	OFF	OFF
Ardyna, M	Gasex	At Chem	Genomic	OFF	Comms	OFF	Remote	OFF	OFF
Barrera Galderique,	Comms	OFF	Lab	Genomic	OFF	Gasex	Remote	OFF	OFF
Bialogrodzka, J	Gasex	Genomic	Lab	OFF	Comms	OFF	At Chem	OFF	Cruise
Bikkina, S	Genomic	OFF	Lab	Remote	OFF	Gasex	Comms	OFF	OFF
Bordelon, L	At Chem	OFF	Lab	Genomic	OFF	Comms	Gasex	OFF	OFF
Böttjer, D	Genomic	Remote	OFF	Gasex	OFF	At Chem	OFF	Comms	OFF
Bressac, M	Gasex	Genomic	Remote	OFF	Comms	At Chem	OFF	OFF	OFF
Bureekul, S	Gasex	Genomic	Lab	OFF	Comms	Remote	OFF	OFF	OFF
Carozza, D	Genomic	OFF	Cruise	Lab	OFF	Comms	Gasex	OFF	OFF
Carranza, M	At Chem	OFF	Lab	Genomic	OFF	Comms	Gasex	OFF	OFF
Cheah, W	OFF	Comms	Gasex	Genomic	OFF	At Chem	Remote	OFF	OFF
Coupel, P	Remote	OFF	Genomic	At Chem	OFF	Gasex	Comms	OFF	OFF
Das, S	At Chem	Gasex	Remote	OFF	OFF	Cruise	OFF	Comms	OFF
Dekaeszemacker, J	Remote	OFF	At Chem	Genomic	OFF	Comms	Gasex	OFF	OFF
Duan, Z	Comms	Genomic	Cruise	Lab	OFF	OFF	Remote	OFF	OFF
Durkin, C	Remote	Gasex	At Chem	OFF	OFF	OFF	Lab	Comms	OFF
Fawcett, S	OFF	Comms	Gasex	At Chem	OFF	Genomic	Remote	OFF	OFF
Frenger, I	At Chem	OFF	Lab	Genomic	OFF	Comms	Gasex	OFF	Cruise
Friedl, F	Remote	OFF	At Chem	Genomic	OFF	Comms	Cruise	OFF	OFF
Galgani, L	OFF	Genomic	Remote	Comms	OFF	At Chem	Cruise	OFF	OFF
Galindo, V	Remote	OFF	Genomic	At Chem	OFF	Comms	Gasex	OFF	Cruise
Garcia-Reyes, M	Genomic	OFF	Lab	At Chem	OFF	OFF	Remote	Comms	Cruise
Geiger, E	At Chem	Gasex	Genomic	OFF	OFF	Comms	Lab	OFF	OFF
Gonzalez, B	OFF	At Chem	Genomic	Comms	OFF	Remote	Cruise	OFF	OFF
Grefe, I	Remote	Gasex	At Chem	OFF	OFF	Comms	Cruise	OFF	OFF
Gregor, L	Remote	OFF	At Chem	OFF	Comms	Lab	Genomic	OFF	OFF
Hakspiel, C	Genomic	Gasex	OFF	Comms	OFF	Remote	At Chem	OFF	OFF
Han, Y	Genomic	Gasex	OFF	Comms	OFF	Remote	At Chem	OFF	OFF
Harrison, E	OFF	At Chem	Cruise	Lab	OFF	OFF	Genomic	Comms	OFF
Hauck, J	OFF	Genomic	Comms	Lab	OFF	Gasex	At Chem	OFF	Cruise
Heimbürger, A	Comms	Remote	Lab	Gasex	OFF	OFF	Genomic	OFF	OFF
Hepach, H	OFF	At Chem	Comms	Remote	OFF	Genomic	Lab	OFF	OFF
Hernando Morales,	OFF	Remote	Comms	Gasex	OFF	Genomic	Remote	OFF	OFF
Hoppe, C	OFF	At Chem	Gasex	Comms	OFF	Genomic	Remote	OFF	OFF
Horbanski, M	Comms	OFF	Cruise	Lab	OFF	Remote	Genomic	OFF	OFF
Huang, K	OFF	Comms	Gasex	At Chem	OFF	Genomic	Lab	OFF	Cruise
Igarza Tagle, M	Gasex	Genomic	OFF	Remote	Comms	At Chem	OFF	OFF	OFF
Kersalé, M	At Chem	Remote	Gasex	Comms	OFF	OFF	Genomic	OFF	OFF
Kim, T-W	Genomic	OFF	Remote	At Chem	OFF	Lab	OFF	Comms	OFF
Krijnen, J	OFF	Genomic	Cruise	Lab	OFF	At Chem	Comms	OFF	OFF
Kvale, K	At Chem	OFF	Comms	Cruise	OFF	Lab	Gasex	OFF	OFF
Laufkoetter, C	Comms	OFF	At Chem	Cruise	OFF	Lab	Gasex	OFF	OFF
Lawler, M	OFF	Remote	Genomic	Cruise	OFF	Lab	OFF	Comms	OFF
Li, C	Genomic	Gasex	OFF	Genomic	OFF	OFF	Cruise	Comms	OFF
Lien, C-C	Gasex	At Chem	OFF	Genomic	Comms	OFF	Cruise	OFF	OFF
Lin, H	Remote	OFF	At Chem	Genomic	OFF	Gasex	Comms	OFF	OFF

	WedPM	ThursPM	FriAM	FriPM	FriEVE	SatAM	SatPM	SatEVE	SunDAY
Majkut, J	OFF	Genomic	Comms	Cruise	OFF	Lab	At Chem	OFF	OFF
Mamnun, N	At Chem	OFF	OFF	Cruise	Comms	Lab	Genomic	OFF	OFF
Melancon, J	OFF	Genomic	Comms	Gasex	OFF	Remote	At Chem	OFF	OFF
Molina, E	OFF	Comms	Gasex	Lab	OFF	At Chem	Genomic	OFF	OFF
Nagel, L	OFF	Genomic	Comms	Cruise	OFF	Lab	At Chem	OFF	OFF
Pandey, S	At Chem	OFF	Remote	Genomic	OFF	Gasex	Comms	OFF	Cruise
Pottekkat	OFF	Remote	Comms	Gasex	OFF	Lab	Genomic	OFF	OFF
Racape, V	Comms	At Chem	Genomic	Cruise	OFF	Lab	OFF	OFF	OFF
Reboreda, R	OFF	Comms	Gasex	At Chem	OFF	Genomic	Cruise	OFF	OFF
Ribas-Ribas, M	OFF	At Chem	Gasex	Lab	OFF	Genomic	OFF	Comms	Cruise
Salisbury, D	Comms	OFF	At Chem	Cruise	OFF	Lab	Genomic	OFF	OFF
Sarangi, T	OFF	Comms	Genomic	Remote	OFF	Cruise	Lab	OFF	OFF
Sargeant, S	Genomic	OFF	Remote	Gasex	OFF	At Chem	Comms	OFF	OFF
Simonella, L	OFF	Comms	Genomic	Remote	OFF	Cruise	Lab	OFF	OFF
Sujith, K	At Chem	Gasex	OFF	Comms	OFF	Genomic	Cruise	OFF	OFF
Tupman, D	Genomic	OFF	Comms	At Chem	OFF	Cruise	Lab	OFF	OFF
Turi, G	OFF	At Chem	Genomic	Comms	OFF	Cruise	Lab	OFF	OFF
Webb, A	OFF	Remote	At Chem	Comms	OFF	Cruise	Lab	OFF	OFF
Wetzel, F	OFF	Comms	Genomic	Gasex	OFF	Cruise	Lab	OFF	OFF
Yang, J-Y	Genomic	OFF	Remote	At Chem	OFF	Gasex	Comms	OFF	OFF
Zabori, J	OFF	Comms	Genomic	Remote	OFF	Cruise	Lab	OFF	OFF

## Poster Session List

POSTER SESSION 1 Tuesday 29 August		POSTER SESSION 2 Wednesday 30 August		POSTER SESSION 3 Thursday 1 September	
Akoglu, E	Bureekul, S	Galgani, L	Hepach, H	Laufkoetter, C	Racape, V
Anake, W	Carozza, D	Galindo, V	Hernando Morales, V	Lawler, M	Reboreda, R
Andrews, O	Carranza, M	Garcia-Reyes, M	Hoppe, C	Li, C	Ribas-Ribas, M
Andrews, S	Cheah, W	Geiger, E	Horbanski, M	Lien, C-C	Salisbury, D
Angelo Goncalves, I	Coupe, P	Gonzalez, B	Huang, K	Lin, H	Sarangi, T
Ardyna, M	Das, S	Grefe, I	Igarza Tagle, M	Majkut, J	Sargeant, S
Barrera Galderique, A	Dekaezemacker, J	Gregor, L	Kersalé, M	Mamnun, N	Simonella, L
Bialogrodzka, J	Duan, Z	Hakspiel, C	Kim, T-W	Melancon, J	Sujith, K
Bikkina, S	Durkin, C	Han, Y	Krijnen, J	Molina, E	Tupman, D
Bordelon, L	Fawcett, S	Harrison, E	Kvale, K	Nagel, L	Turi, G
Böttjer, D	Frenger, I	Hauck, J	Yang, J-Y	Pandey, S	Webb, A
Bressac, M	Friedl, F	Heimbürger, A	Zabori, J	Pottekkat Jayapalan, V	Wetzel, F

## STUDENT PROFILES



### Ekin Akoglu

**Email:** ekin@ims.metu.edu.tr

**Institute:** Middle East Technical University, Erdemli/Mersin, Turkey

**Poster Title:** Ecological Evolution of the Black Sea from 1960s to 2000; An integrity check

**Poster Abstract:** The Black Sea ecosystem has evolved from a quasi-pristine state during 1950s and early 1960s into an exploited and degraded system during 1970s and 1980s by anthropogenic interventions. In this work, this evolution was investigated from 1960s to 2000 based on the energy transfers and ecosystem organization via mass-balance modelling.



### Wini-fred Anake

**Email:** fopeace@yahoo.com

**Institute:** Covenant University, Ota, Nigeria

**Poster Title:** Air-sea seasonal CO<sub>2</sub> fluxes in near shore seawater of North Atlantic Ocean

**Poster Abstract:** This research focuses on the assessment of the interseasonal fluxes and variability of pCO<sub>2</sub> using in situ baseline measurement of salinity, total alkalinity, temperature and pH from the coastal seawater of North Atlantic Ocean. The trends in air- sea flux, sink capacity as well as the driving mechanisms are investigated.



### Oliver Andrews

**Email:** o.andrews@uea.ac.uk

**Institute:** University of East Anglia, Norwich, UK

**Poster Title:** Towards the attribution of recent trends in oceanic oxygen to climate change and variability

**Poster Abstract:** Oxygen is sensitive to changes in ocean temperature, circulation and biogeochemistry and thus could be a powerful tool to detect and attribute anthropogenic climate change in the ocean. Our study aims to constrain the contribution of natural and anthropogenic forcing to observed variability in oxygen using an ocean biogeochemistry model.



### Stephen Andrews

**Email:** University of York, UK

**Institute:** sja513@york.ac.uk

**Poster Title:** Global quantification of very short-lived halocarbon species

**Poster Abstract:** Increasing evidence points to a significant role for very short-lived halocarbons (VSLH) in tropospheric and stratospheric chemistry. Although numerous datasets exist, the lack of a common calibration scale limits the comparability of measurements. This poster describes research aimed at reducing uncertainties in VSLH quantification and hence improving global emission estimates.



### Iury Angelo-Goncalves

**Email:** iury.angelo@cptec.inpe.br; iagmat@yahoo.com.br

**Institute:** CPTEC/INPE, São Paulo, Brazil

**Poster Title:** A simple spume droplets (sea-spray) and wave stress parameterizations to study the impact on maritime near-surface variables.

**Poster Abstract:** The impact of ocean gravity waves on the wind and temperature above the surface is investigated using a simple one-dimensional boundary layer model. The effect of the wave-induced stress is evaluated using a formulation applied on the complete wave spectrum, including mainly the wave high frequencies components.



### Mathieu Ardyna

**Email:** Mathieu.Ardyna@takuvik.ulaval.ca

**Institute:** University Laval, Québec, Canada

**Poster Title:** Vertical distribution of phytoplankton communities in the Arctic Ocean: Impact of subsurface chlorophyll maxima on annual primary production estimates

**Poster Abstract:** Description and characterization of subsurface chlorophyll maxima (SCM) in the Arctic Ocean. The spatio-temporal variability of SCM in terms of occurrence, magnitude and intensity will be presented and discussed. These phenomena, which are important for large-scale primary production estimates, seem a dominant feature with significant biogeographical differences.



**Anna Barrera-Galderique**

**Email:** anna.bargald@gmail.com

**Institute:** Universidad de Las Palmas de Gran Canaria, Spain

**Poster Title:** 3-year CO<sub>2</sub> fluxes in the eastern North Atlantic Ocean

**Poster Abstract:** In the frame of the CARBOOCEAN Project, the QUIMAVOS line was monthly monitoring the carbon dioxide partial pressure at the eastern North Atlantic Ocean. The results showed a complex surface hydrodynamic system, with coast upwelling, vertical mixing processes and fronts affecting the physical, chemical and biological parameters that control the surface distribution of fCO<sub>2</sub>.



**Jagoda Bialogrodzka**

**Email:** jagoda.bialogrodzka@gmail.com

**Institute:** Polish Academy of Sciences, Sopot, Poland

**Poster Title:** Numeric Baltic Sea

**Poster Abstract:** A numeric model of the Baltic Sea is creating on the basis of Princeton Ocean Model. Very important thing is to adapt well the model to the conditions of the Baltic Sea, which are particularly specific. Model validation and testing is performed on the basis of remote sensing techniques.



**Srinivas Bikina**

**Email:** srinivas.prl@gmail.com; srinivas@prl.res.in

**Institute:** Andhra University, Navrangpura, India

**Poster Title:** Aerosol iron solubility over Bay of Bengal and Arabian Sea: Role of natural and anthropogenic aerosols

**Poster Abstract:** Based on the seasonal sampling, our study reveals that the fractional solubility of aerosol iron ( $Fe_{ws} \% = Fe_{ws}/Fe_{Tot} * 100$ ;  $Fe_{ws}$  = soluble iron,  $Fe_{Tot}$  = total aerosol iron) is 1-2 orders of magnitude higher in the MABL of Bay of Bengal compared to that over Arabian Sea.



**Laura Bordelon**

**Email:** lb@gpi.uni-kiel.de

**Institute:** University of Kiel, Germany

**Poster Title:** Effects of CO<sub>2</sub>-dependent DOC production on carbon sequestration in an ocean biogeochemical model

**Poster Abstract:** With an Ocean Biogeochemical model, we test the potential influence of CO<sub>2</sub>-dependent formation of dissolved organic matter (DOM) on marine carbon sequestration. Using an idealized CO<sub>2</sub>-scenario (4xCO<sub>2</sub>) we find a positive feed-back of increased DOM formation on atmospheric CO<sub>2</sub> due to shallower nutrient recirculation and reduced particle export.



**Daniela Böttjer**

**Email:** dbottjer@hawaii.edu

**Institute:** University of Hawaii, Honolulu, USA

**Poster Title:** Diazotroph activity and community structure over an annual cycle under different pCO<sub>2</sub> conditions at Station ALOHA

**Poster Abstract:** The ocean's enrichment with anthropogenic CO<sub>2</sub> and the concomitant acidification might have considerable consequences for marine nutrient biogeochemistry and the microbes that mediate many of the key nutrient transformations. In the North Pacific Subtropical Gyre, N<sub>2</sub> fixing bacteria occupy a key position in the pelagic food web by supplying the system with new nitrogen. Thus, we explored their short-term response to predicted, future CO<sub>2</sub> conditions at Station ALOHA.



**Matthieu Bressac**

**Email:** bressac@obs-vlfr.fr

**Institute:** CNRS-UPMC, Villefranche-sur-Mer, France

**Poster Title:** Fate and effects of Saharan dust in seawater: results from simulated dust experiments

**Poster Abstract:** The interaction between DOM, POC aggregates and suspended 'ballast' minerals has recently been considered as a possible major control over POC flux. In addition, the particle sink in the water column can affect the distribution of nutrients on the dissolved-colloidal-particulate continuum. The aim of this project is to study the impact of Saharan dust in these processes using both optical and chemical measurements.



### Sujaree Bureekul

**Email:** sujaree@aori.u-tokyo.jp; bsujaree@gmail.com

**Institute:** University of Tokyo, Kashiwa, Japan

**Poster Title:** The investigation study of phosphorus in sea-surface microlayer (SML) as the interface layer between ocean and atmosphere

**Poster Abstract:** Sea surface microlayer (SML) known for its enrichment, the early investigation shows the higher concentration of P in SML (mainly TDP) than underline water. Sea bubble bursting mechanism is believed to transfer Phosphorus into the atmosphere. Especially, for Open Ocean with no land P supply, SML may be an alternate P source maintaining the concentration of atmospheric P.



### David Carozza

**Email:** david.carozza@gmail.com

**Institute:** McGill University, Montreal, Canada

**Poster Title:** Parameterising trophic dynamics in a marine biogeochemical model

**Poster Abstract:** Marine ecosystems play a crucial role in modulating nutrient cycling and dissolved gas concentrations. However, the effects that upper trophic level dynamics have on these processes are difficult to discern at the global scale. Here, we aim to study the interactions and feedbacks between trophic dynamics and marine biogeochemical cycling.



### Magdalena Carranza

**Email:** maucarranza@ucsd.edu

**Institute:** Scripps Institution of Oceanography, San Diego, CA, USA

**Poster Title:** High frequency winds: their impact on the mixed layer depth and nutrient entrainment

**Poster Abstract:** Gustiness in the winds facilitate the entrainment of Fe from subsurface Antarctic Circumpolar Current waters into the euphotic zone through mixed layer dynamics. The response of the mixed layer depth to high frequency winds is addressed by forcing the PWP mixed layer model with satellite winds from three microwave sensors.



### Wee Cheah

**Email:** wee.cheah@utas.edu.au

**Institute:** University of Tasmania, Hobart, Australia

**Poster Title:** Photosynthetic performance of phytoplankton in the Southern Ocean south of Tasmania

**Poster Abstract:** Phytoplankton's photochemical efficiency of photosystem II (Fv/Fm) measured along a repeated transect from 2002-2009 in the Southern Ocean showed higher values in the Subtropical Zone and Antarctic Zone than other regions. Daily Fv/Fm patterns indicate that cells in the Southern Ocean may produce excess light harvesting antennae complexes under high-nitrate low iron condition.



### Pierre Coupel

**Email:** piercoppel@hotmail.fr

**Institute:** University of Pierre and Marie Curie, Paris, France

**Poster Title:** Impact of sea ice decrease on phytoplankton and carbon cycle in Western Arctic

**Poster Abstract:** Melting of ice leads to physical changes affecting the nutrients and the phytoplankton distribution. By modifying the phytoplankton the efficiency of the biological pump could be strongly affected leading to an unequivocal feedback on climate. Three oceanographic cruises in Arctic (2008, 2009 and 2010) give us the opportunity to investigate phytoplankton and carbonates during summers of exceptional ice retreat.



### Surajit Das

**Email:** surajit@nitrrkl.ac.in

**Institute:** National Institute of Technology, Rourkela, India

**Poster Title:** Experimental approaches to study environmental variability and climate change on marine microorganisms

**Poster Abstract:** Survival and growth of bacteria in response to stress viz. temperature, pH and UVR can be estimated to identify 'winners' or 'losers'. DNA damage and repair pathway (photo reactivation, NER pathway and RecA expression) in mutant bacteria can be studied to see the role of these genes in repair mechanisms.



**Julien Dekezemacker**

**Email:** julien.dekezemacker@univmed.fr

**Institute:** LOPB, Marseille, France

**Poster Title:** Dinitrogen fixation above oxygen minimum zones

**Poster Abstract:** Recent geochemical studies based on N:P ratios indicate that N<sub>2</sub> fixation would be important above OMZs and spatially coupled to N-loss processes. We verified this hypothesis on and above the Peru-Chile OMZ, where N<sub>2</sub> fixation rates are in the same order of magnitude of those commonly measured in oligotrophic gyres.



**Ziqiang Duan**

**Email:** dzq264@163.com

**Institute:** Ocean University of China, Qingdao, China (Beijing)

**Poster Title:** An approach to minimize artefacts in determination of air-sea CO<sub>2</sub> flux using eddy covariance technique

**Poster Abstract:** The normalised spectra of scalar quantities (CO<sub>2</sub>, H<sub>2</sub>O and T) show dissimilarity in part of the database obtained in the north Yellow Sea using an open-path eddy covariance system. It is possibly caused by the cross-sensitivity of the CO<sub>2</sub> sensor to water vapour fluctuations. A ratio approach was used to correct the data, based on spectral similarity between latent and sensible heat fluxes and the CO<sub>2</sub> flux.



**Colleen Durkin**

**Email:** cdurkin@uw.edu

**Institute:** University of Washington, Seattle, USA

**Poster Title:** Physiological diversity of diatoms influences silicon biogeochemistry in iron limited environments.

**Poster Abstract:** Diatoms are single-celled algae with a unique role in biogeochemical cycles due to their high productivity and silica cell walls. We use a combination of molecular and microscopic techniques on lab isolates and field populations to determine how diatom species composition and physiology influences silicon cycling in iron-limited environments.



### Sarah Fawcett

**Email:** sfawcett@princeton.edu

**Institute:** Princeton University, NJ, USA

**Poster Title:** Eukaryotes dominate new production in the Sargasso Sea

**Poster Abstract:** Coupling flow cytometry with sensitive N isotope analysis, we find that, in the summertime Sargasso Sea, prokaryotic phytoplankton have uniformly low  $^{15}\text{N}/^{14}\text{N}$ , consistent with their reliance on regenerated N. In stark contrast, the  $^{15}\text{N}/^{14}\text{N}$  of eukaryotic phytoplankton is higher, implying that eukaryotes predominantly consume subsurface nitrate, dominating new production and driving the region's biological pump.



### Ivy Frenger

**Email:** ivy.frenger@env.ethz.ch

**Institute:** ETHZ, Zürich, Switzerland

**Poster Title:** Eddies and chlorophyll in the Southern Ocean

**Poster Abstract:** We examined the relations between mesoscale eddies and chlorophyll-a (chl-a) based on satellite data from 1997 - 2010 south of 30S. We found a significant but spatially as well as temporally heterogeneous imprint of eddies on chl-a. We suggest that the detected imprint is mainly caused by stirring and transport of chl-a by eddies.



### Felix Friedl

**Email:** felix.friedl@iup.uni-heidelberg.de

**Institute:** University of Heidelberg, Germany

**Poster Title:** Measurements of oxygen concentration profiles in the water

**Poster Abstract:** A high resolution laser induced phosphorescence method to measure oxygen concentration profiles in the water-sided mass boundary layer under the wind-driven free water surface is presented. The local gas transfer velocity can be obtained out of these profiles. The goal of these measurements is the validation of gas transfer models in the small wind range.



### Luisa Galgani

**Email:** luisa.galgani@awi.de

**Institute:** Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

**Poster Title:** The C-cycle on ocean's surface: insights to the composition of the sea-surface micro-layer.

**Poster Abstract:** The ocean's surface is a special environment having a key role in the interactions between the underlying water and the atmosphere. The sea-surface micro-layer (SML), the boundary between these two compartments, has been hypothesized as a gelatinous layer mediating fluxes of mass and energy and influencing the emission of organic particles from the ocean.



### Virginie Galindo

**Email:** virginie.galindo@gmail.com

**Institute:** University Laval, Québec City, Canada

**Poster Title:** Influence of a rapid increase in light intensity on DMSP synthesis by ice algae and phytoplankton during the spring ice melt period in the Arctic

**Poster Abstract:** It is at the marginal ice zones that maximum DMS and DMSP concentrations are generally measured in polar regions. Here we tested the hypothesis that these DMS peaks partly result from the physiological response of ice algae and under-ice phytoplankton to the increase in light they experience when they exist the ice cover.



### Marisol Garcia-Reyes

**Email:** marisolgr@gmail.com

**Institute:** University of California, Davis, USA

**Poster Title:** Variability in coastal upwelling off California

**Poster Abstract:** A. Bakun hypothesized that the increase in green-house gases would lead to intensification of coastal upwelling. Here, buoy data off California is analyzed to investigate the long term variability in magnitude, timing and synoptic variability of coastal upwelling.



**Erick Geiger**

**Email:** egeiger@udel.edu

**Institute:** University of Delaware, Lewes, USA

**Poster Title:** Satellite-derived Coastal ocean and estuarine salinity in the Mid-Atlantic

**Poster Abstract:** Salinity is a basic oceanographic property that is not routinely estimated by satellites in coastal systems. With this research we aim to predict salinity from ocean colour data measured by MODIS-Aqua at high resolution. From this we can observe trends in salinity and compare our results with existing models.



**Belen Gonzalez**

**Email:** b.gonzalez@iqog.csic.es

**Institute:** CSIC, Madrid/Barcelona, Spain

**Poster Title:** Persistent organic pollutants distribution, dynamics and impact in the global ocean

**Poster Abstract:** Persistent organic pollutants (POPs) are semi-volatile, toxic and have potential for long-range atmospheric transport. This study aims at assessing the global distribution of POPs in the atmosphere, seawater and planktonic food webs by generating the largest existing dataset allowing to determine the key processes governing their fate and validating models.



**Imke Grefe**

**Email:** i.grefe@uea.ac.uk

**Institute:** University of East Anglia, Norwich, UK

**Poster Title:** Measurements of the <sup>17</sup>O isotope excess in marine nitrous oxide

**Poster Abstract:** Nitrous oxide N<sub>2</sub>O is a strong greenhouse gas and one of the most important ozone-depleting substances currently emitted. The <sup>17</sup>O isotope excess observed in tropospheric N<sub>2</sub>O is a potential tracer for microbial cycling. A method for measuring this isotope signature in marine samples was developed and tested.



### Luke Gregor

**Email:** lukegre@gmail.com

**Institute:** University of Cape Town, South Africa

**Poster Title:** TCO<sub>2</sub> and TA in the southern Benguela: A seasonal investigation

**Poster Abstract:** A process analysis of total carbon and alkalinity in the southern Benguela for 2010 reveals a strongly physically driven system. Coastal upwelling is juxtaposed by strong biological drawdown, thus creating a complex system. It is in this environment that the state and trends of impacting marine carbonate system parameters, such as pH and calcite saturation are assessed.



### Cristian Hakspiel

**Email:** Cristian\_hakspiel@yahoo.com

**Institute:** CICIMAR-IPN, La Paz, Mexico

**Poster Title:** Contribution of denitrification and nitrogen fixation process to nitrogen balance in coastal system in the Gulf of California.

**Poster Abstract:** Nitrogen has been considered as the limiting nutrient in La Paz Bay. In this place, seasonal and hydrographic (e.g. stratification, minimum oxygen zone) conditions suggest that both nitrogen fixation and denitrification could be important pathways for nitrogen balance. This study will estimate these pathways and microorganism participation in water column.



### Emily Harrison

**Email:** emily.lauren.harrison@gmail.com

**Institute:** University of Delaware, Lewes, USA

**Poster Title:** Measuring rain-induced momentum exchange at the ocean surface under low to moderate wind speed conditions

**Poster Abstract:** We present results from laboratory experiments on the generation of turbulence and the damping of the wind-wave field by rain. Measurement techniques included particle image velocimetry, laser induced fluorescence, and optical wave height imagery. We have conducted 70 experiments encompassing 5 wind speeds, 7 rain rates, and two salinities.



### Judith Hauck

**Email:** judith.hauck@awi.de

**Institute:** Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

**Poster Title:** Insignificant buffering capacity of Antarctic shelf carbonates

**Poster Abstract:** We used the relationship between  $\text{CaCO}_3$  in shelf sediments and primary production to map  $\text{CaCO}_3$  all around Antarctica. An inventory of sedimentary  $\text{CaCO}_3$  could be estimated, indicating that ocean acidification will not be delayed by dissolution of  $\text{CaCO}_3$  and the ocean's capability to take up  $\text{CO}_2$  will not be strengthened.



### Alexie Heimburger

**Email:** alexie.heimburger@lisa.u-pec.fr

**Institute:** Universite Denis Diderot, Paris, France

**Poster Title:** Atmospheric deposition of trace metals over the Southern Ocean: a time series at Kerguelen and Crozet Islands

**Poster Abstract:** Atmospheric deposition over Southern Ocean is directly measured and now in agreement with global deposition models but not with indirect calculations derived from aerosol measurements. Total deposition was monitored at Crozet and Kerguelen Islands during one and two years. Measured dust and iron deposition fluxes were respectively  $680 \mu\text{g m}^{-2}\text{d}^{-1}$  and  $540\text{nmolFe m}^{-2}\text{d}^{-1}$ .



### Helmke Hepach

**Email:** hhepach@ifm-geomar.de

**Institute:** IFM-GEOMAR, Kiel, Germany

**Poster Title:** Halocarbons in and above the tropical Atlantic

**Poster Abstract:** Short lived halogenated substances (halocarbons) occur naturally in the oceans. They contribute either direct or indirect to the overall halogen budget in the atmosphere, thus also influencing ozone depletion. Tropical convection leads to enhanced transport of halocarbons in this area. Here, results of cruises in the tropical Atlantic are presented.



**Victor Hernando-Morales**

**Email:** victorace21@hotmail.com

**Institute:** University of Vigo, Spain

**Poster Title:** Response of bacterial community structure and function to experimental rainwater additions in a coastal eutrophic embayment

**Poster Abstract:** Study of the effect of 2.5% (v/v) additions of rainwater collected at a marine, urban and rural site on bacterioplankton metabolism and community composition was evaluated in microcosm experiments with natural plankton populations from the Ría de Vigo (NW Spain) during three different seasons.



**Clara Hoppe**

**Email:** clara.hoppe@awi.de

**Institute:** Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

**Poster Title:** Effects of CO<sub>2</sub> and iron on Southern Ocean phytoplankton communities

**Poster Abstract:** During a Southern Ocean cruise, the influence of naturally prevailing environmental conditions on phytoplankton structure, primary production and other physiological parameters was investigated. In additional incubation experiments, combined effects of CO<sub>2</sub> and iron were tested. Preliminary results suggest that both CO<sub>2</sub> and iron affect phytoplankton community structure and physiology.



**Martin Horbanski**

**Email:** martin.horbanski@iup.uni-heidelberg.de

**Institute:** University of Heidelberg, Germany

**Poster Title:** In-Situ Measurements of Iodine Monoxide at Coastal Areas and on the Open Ocean by Cavity Enhanced (CE-) DOAS

**Poster Abstract:** IO influences the ozone budget and can act as precursor for cloud condensation nuclei. Two portable CE-DOAS instruments were developed which for the first time allow measuring IO directly at the source. IO mixing ratios of several 10ppt were detected at different locations on the Irish west coast while ship borne open ocean measurements showed much lower concentrations than expected.



**Kuan Huang**

**Email:** kuanhuang@hotmail.com

**Institute:** Princeton University, NJ, USA

**Poster Title:** Export production and its regulating factors in the West Antarctica Peninsula region of the Southern Ocean

**Poster Abstract:** We report estimates of net and gross productivity for Januaries of 2008-2010 in the western Antarctica Peninsula region of the Southern Ocean. Study of these estimates with other environmental/ecological data indicates that MLD, iron bioavailability, and community structure could be major factors regulating phytoplankton production in this region.



**Maria Carmen Igarza-Tagle**

**Email:** mcigarza@yahoo.es; maria.igarza.t@upch.edu.pe

**Institute:** Universidad Peruana Cayetano Heredia, Lima, Perú

**Poster Title:** Petrographical and geochemical study of organic matter from surficial sediments of the Peruvian upwelling zone. Implications of its origin and preservation

**Poster Abstract:** The high productivity and the marked oxygen minimum zone that characterizes the northern Humboldt Current System allow the accumulation and preservation of high contents of organic matter in the sediments. The analysis of the sedimentary organic matter off Peru by petrographical and geochemical techniques has provided important information about its composition, origin and state of preservation.



**Sujith Kalarikkal Bhaskaran**

**Email:** sujithpanikar06@gmail.com

**Institute:** National Institute of Oceanography, Goa, India

**Poster Title:** Variation of Dimethylsulphide and related compounds during LOHAFEX cruise.

**Poster Abstract:** Dimethylsulphide (DMS), Dimethylsulphonioacetate (DMSPt) and Dimethylsulphoxide (DMSOt) were analyzed from the inpatch and outpatch stations during iron fertilization experiment LOHAFEX. DMS showed an increase of ~3 fold in the in-patch stations. Overall DMSPt concentrations showed a matching trend with the chl. The dynamics of DMS, DMSPt and DMSOt are discussed in the light of supporting parameters.



### Marion Kersalé

**Email:** marion1406@hotmail.fr

**Institute:** LOPB, Marseille, France

**Poster Title:** A numerical study on the collision of a Meddy with a seamount

**Poster Abstract:** Mediterranean water eddies (Meddies) are prominent hydrological structures of the North Atlantic. The purpose of this study is to examine the dynamics and the processes involved in the collision of a Meddy with a seamount. The high resolution numerical study of this interaction has been conducted with the Regional Ocean Modelling System (ROMS).



### Tae-Wook Kim

**Email:** ktwtw@postech.ac.kr

**Institute:** Pohang University of Science and Technology, Republic of Korea

**Poster Title:** Increasing N:P ratio in the marginal seas of the north-western Pacific Ocean due to atmospheric deposition of pollutant nitrogen

**Poster Abstract:** The increase in N availability within the study area was mainly driven by increasing N concentrations, whereas the P concentration remained approximately unchanged. This trend is most likely due to atmospheric N deposition which was found to correlate >50% of the temporal variations of N availability in the study area.



### Justin Krijnen

**Email:** j.krijnen@uea.ac.uk

**Institute:** University of East Anglia, Norwich, UK

**Poster Title:** Understanding the mechanisms of inter-annual variability of surface water pCO<sub>2</sub> in the North Atlantic.

**Poster Abstract:** Measurements of surface water pCO<sub>2</sub> in the North Atlantic exhibit significant inter-annual variability. We hypothesise that this variability is driven by the oceanic circulation. A stronger (weaker) gyre circulation would enhance (decrease) vertical mixing during winter, thereby transporting more (less) carbon-rich water to the surface and increasing (decreasing) the pCO<sub>2</sub>.



### Karin Kvale

**Email:** k.kvale@unsw.edu.au

**Institute:** University of New South Wales, Sydney, Australia

**Poster Title:** Implementing calcifiers in the UVIC ESCM

**Poster Abstract:** Global climate models commonly utilise parameterisations of observed nutrient relationships to represent ocean carbon cycle biology. These have limited utility for assessing heterogeneous response under climate change, and for quantifying the “known unknowns” of ecosystem mechanics. The UVic ESCM now includes a calcifier functional type, which is presented here.



### Charlotte Laufkoetter

**Email:** c.laufkoetter@gmail.com

**Institute:** ETHZ, Zürich, Switzerland

**Poster Title:** Trends and variability of plankton functional types in CCSM-BEC

**Poster Abstract:** We analyse the relationship between plankton functional type (PFT) distribution, primary production and export production in a Dynamic Green Ocean Model (CCSM-BEC) for the period 1950 to 2006. We extract dominance patterns and trends of PFT distributions, primary production and export production, and investigate links to important climate indices.



### Michael Lawler

**Email:** mlawler@uci.edu

**Institute:** University of California, Irvine, USA

**Poster Title:** HOCl and Cl<sub>2</sub> in the remote marine atmosphere

**Poster Abstract:** The first simultaneous measurements of tropospheric HOCl and Cl<sub>2</sub> were made at a semi-remote site in the tropical Atlantic boundary layer. HOCl and Cl<sub>2</sub> ranged from <5-173 and <1-35 ppt, respectively. The current understanding of chlorine cycling and implications for its impacts on tropospheric chemistry are discussed.



### Chengxuan 'Caroline' Li

**Email:** caroline210xuan@gmail.com

**Institute:** First Institute for Oceanography, Qingdao, China (Beijing)

**Poster Title:** Bio-availability and turnover of dissolved dimethylsulfoniopropionate (DMSP) in coastal waters of the Gulf of Mexico

**Poster Abstract:** We compared biological consumption rates of DMSPd in coastal seawater determined by the inhibitor approach with GBT and the 35S-DMSP tracer loss kinetics approach. Our tests confirmed that GBT strongly inhibited DMSPd degradation and that 35S-DMSP gave an accurate estimate of DMSPd loss rate constants. DMSPd concentration measured by small volume drip filtration is likely to overestimate the bioavailable DMSPd concentration.



### Chun Chui Lien

**Email:** mg.lien@gmail.com

**Institute:** National Taiwan University, Taipei, China (Taipei)

**Poster Title:** The typhoon-Induced biogeochemical response in the western North Pacific Ocean

**Poster Abstract:** Using advanced multiple satellite remote sensing data and an ocean primary production model to observe the biological effects of typhoons, we examined 30 typhoons that passed through the oligotrophic area of the western North Pacific Ocean over 6 years. There was an observed increased in chlorophyll-a concentration and a decrease in sea surface temperature after a typhoon's passage.



### Hua Lin

**Email:** linhua@xmu.edu.cn

**Institute:** State Key Laboratory of Marine Environmental Science, Xiamen, China (Beijing)

**Poster Title:** Mechanism of N<sub>2</sub>O production in the South China Sea (SCS) and Western North Pacific (WNP) inferred from its N and O isotopic composition

**Poster Abstract:** We examined N<sub>2</sub>O concentrations and the dual stable isotopic composition of N<sub>2</sub>O in the SCS and WNP to study the mechanisms of N<sub>2</sub>O production and its impact on the atmosphere. Our results showed that the near-surface isotopically depleted oceanic N<sub>2</sub>O source in the SCS was probably produced by bacterial nitrification, and the process of denitrification was not prominent in our study areas.



### Joseph Majkut

**Email:** jmajkut@princeton.edu

**Institute:** Princeton University, NJ, USA

**Poster Title:** A new estimate of the air-sea carbon flux

**Poster Abstract:** A new method of optimally estimating the historical  $p\text{CO}_2$  at the sea-surface is used to quantify the air-sea  $\text{CO}_2$  flux and the time rate of change of  $\Delta p\text{CO}_2$  from 1980 through 2010. The resulting  $p\text{CO}_2$  trends and diagnosed fluxes are provocative. We present regional analysis indicating whether or not modelled trends and feedbacks are occurring in the real earth system.



### Nabir Mamnun

**Email:** nmamnun@gmail.com

**Institute:** University of Chittagong, Bangladesh

**Poster Title:** Influence of wind stress over the Bay of Bengal circulation

**Poster Abstract:** QuikSCAT wind dataset and Richardson ship-drift dataset were used in SAGA-GIS to investigate the correlation between wind stress and the surface circulation in the Bay of Bengal. Strong connection is found with wind stress and circulation. When wind blows SW direction an anti-cyclonic gyre is form and a cyclonic gyre is form with NE wind, due to monsoon effect.



### Josiane Melancon

**Email:** josiane.melancon.1@ulaval.ca

**Institute:** Université Laval, Québec, Canada

**Poster Title:** How ocean acidification will impact Fe-dust delivery to the Northeast Subarctic Pacific

**Poster Abstract:** Asian dust is an important source of iron in the Northeast Subarctic Pacific, an HNLC region limited by iron. Short-term response of the phytoplanktonic community to dust addition in the context of ocean acidification was tested during on-deck dust-enriched acidified incubations in August 2008. Preliminary results will be presented.



### Ernesto Molina Balari

**Email:** ernesto.molinabalari@uts.edu.au

**Institute:** University of Technology, Sydney, Australia

**Poster Title:** Bio-optical properties of sea-ice algae

**Poster Abstract:** This project measures a range of photoinhibitory and photoacclimatory processes in sea-ice algae under various light climates. Direct measurements and model-derived estimates of light transmission through ice and snow will control the sea-ice algae absorption of light and therefore feedback to a range of photoprotective processes. A bio-optical model will be developed to predict the rate of photosynthesis of sea-ice algae given specific light conditions.



### Leila Nagel

**Email:** leila.nagel@iup.uni-heidelberg.de

**Institute:** University of Heidelberg, Germany

**Poster Title:** Heat transfer measurements in the Baltic Sea

**Poster Abstract:** Heat is used as a proxy tracer for gases to study the transport processes across the air-sea-interface. Within three experiments in the Baltic Sea a periodically varying heat flux density was forced onto the water surface and the amplitude damping of the surface temperature was measured from infrared images.



### Sunita Pandey

**Email:** sunitapandey09@gmail.com

**Institute:** National Institute of Oceanography, Goa, India

**Poster Title:** DMSP dynamics is tidally driven in tropical estuarine beach sediments of Dona Paula, Goa, India

**Poster Abstract:** DMSP produced by marine phytoplankton is the primary source of DMS, a radiatively important gas. Intertidal sediments of an estuarine beach produced on an average  $\sim 140$  and  $\sim 6$  nM of these compounds respectively. Measurement made over tidal cycles showed that their dynamics synchronized with these physical forces and is generally coupled to chlorophyll concentrations.



### Vidya Pottekkat Jayapaian

**Email:** pjvidya@gmail.com

**Institute:** National Institute of Oceanography, Goa, India

**Poster Title:** Influence of physical and biological processes on the seasonal cycle of biogenic flux in the Equatorial Indian Ocean

**Poster Abstract:** Seasonal cycle of biogenic fluxes obtained from sediment trap at two locations 5°24'N, 86°46'E (SBBT) and 3°34'N, 77°46'E (EIOT) within the Equatorial Indian Ocean (EIO) were examined to understand the factors that control them. The characteristic of biogenic flux at SBBT was the strong seasonality with peak flux in August, while lack of seasonality characterized the flux at EIOT.



### Virginie Racape

**Email:** virginie.racape@locean-ipsl.upmc.fr

**Institute:** LOCEAN-IPSL, Paris, France

**Poster Title:** Anthropogenic carbon changes in the Irminger Basin: what do we learn from  $\delta^{13}\text{C}_{\text{DIC}}$ ?

**Poster Abstract:** We describe new  $\delta^{13}\text{C}_{\text{DIC}}$  observations obtained in the Irminger Basin during OVIDE cruises (2002, 2006 and 2008) and compare them with historical data (TTO, WOCE) to estimate the  $^{13}\text{C}$  ocean Suess Effect. This parameter offers additional information for understanding the change of anthropogenic  $\text{CO}_2$  storage in the North Atlantic.



### Rosa Reboreda

**Email:** rosa.reboreda@ua.pt

**Institute:** University of Aveiro, Portugal

**Poster Title:** Modelling Seasonal Cycles in the Iberian upwelling ecosystem

**Poster Abstract:** We present a modelling study of the seasonal cycle of the Iberian upwelling system using a three-dimensional (3D), high resolution ocean circulation model, the Regional Ocean Modelling System (ROMS), coupled to a simple Nitrogen based NPZD (Nitrate-Phytoplankton- Zooplankton-Detritus) module. The outputs of the biogeochemical model reasonably reproduced the seasonal trends in phytoplankton/chlorophyll-a concentration in the study area.



**Mariana Ribas-Ribas**

**Email:** maribrib@gmail.com

**Institute:** Universidad de Cádiz, Puerto Real, Spain

**Poster Title:** Spatio-temporal variability of dissolved organic carbon and nitrogen in a coastal area affected by river input: the north-eastern shelf of the Gulf of Cadiz (SW Iberian Peninsula)

**Poster Abstract:** Four surveys were carried out in the north-eastern shelf of the Gulf of Cadiz to investigate the dynamics of dissolved organic carbon (DOC) and dissolved organic nitrogen (DON) in a coastal area affected mainly by river input, but also by primary production / respiration, re-suspension from the sediments, and mixing.



**Dominic Salisbury**

**Email:** eedjs@leeds.ac.uk

**Institute:** University of Leeds, UK

**Poster Title:** Remote sensing of whitecap coverage for sea-spray aerosol flux parameterizations

**Poster Abstract:** Wave breaking and whitecaps have a significant influence on air-sea gas exchange and the production of sea-spray aerosols (SSA) at the ocean surface. A satellite retrieval of the whitecap coverage,  $W$ , has been combined with measurements of important environmental factors - such wave height and sea surface temperature - in a gridded global database, to explore the dependency of white-capping on these variables.



**Tapaswini Sarangi**

**Email:** tapaswini.sarangi@gmail.com

**Institute:** Aryabhata Research Institute, Nainital, India

**Poster Title:** Variations in trace gases over the central Himalayas and Indo-Gangetic plain region

**Poster Abstract:** Measurements of ozone and precursors are made in the central Himalayas and Indo-Gangetic plain region, which show spring maxima and summer minima. Balloon-borne measurements indicate large variability in the vertical distribution of ozone over this region. Box model simulations suggest significant role of boundary layer processes in ozone variations.



### Stephanie Sargeant

**Email:** stsa@pml.ac.uk

**Institute:** Plymouth Marine Laboratory, UK

**Poster Title:** Biogeochemical cycling of methanol in seawater

**Poster Abstract:** Methanol, an Oxygenated Volatile Organic Compound (OVOC) is ubiquitous in the atmosphere and plays an important role in atmospheric chemistry. Methylotrophic bacteria can use methanol as their sole energy and carbon source. Microbial loss rates of methanol in seawater were measured during a transect of the Atlantic Ocean (50°N - 55°S), known methylotrophic bacteria were identified throughout.



### Lucio Simonella

**Email:** lsimonella@efn.uncor.edu

**Institute:** Universidad Nacional de Córdoba (CICTERRA), Argentina

**Poster Title:** Speciation of Fe in southern South America (SSA) dust: implications for past and present biological processes of the Southern Ocean.

**Poster Abstract:** The main goal of our study is to characterize the amount of bio-available Fe transported by eolian materials deflated from SSA and evaluate its potential effect on Southern Ocean fertilization. Then, dust/volcanic ash as well as topsoil samples were characterized in term of mineralogical, chemical, isotopic and textural composition. Fe availability studies were performed using continuous flow analysis and GAAS detection.



### David Tupman

**Email:** University of Leeds, UK

**Institute:** d.tupman@see.leeds.ac.uk

**Poster Title:** Wave Breaking effects on Air Sea Fluxes

**Poster Abstract:** The Waves, Aerosol and Gas Exchange Study (WAGES) involves making long term autonomous open ocean eddy covariance measurements of the CO<sub>2</sub> flux, on RSS James Clark Ross. The combination of a wide range of conditions and sheer volume of data provide a unique opportunity to investigate wave breaking effects on fluxes of CO<sub>2</sub>, heat, moisture, and momentum. In addition to flux estimates, whitecap fraction photography, 2-D Wave Radar, and a buoy to measure wave spectra are all utilised.



### Giuliana Turi

**Email:** giuliana.turi@env.ethz.ch

**Institute:** ETHZ, Zürich, Switzerland

**Poster Title:** Mesoscale eddies and the coastal carbon cycling in the California upwelling system

**Poster Abstract:** We investigate the contribution of eddies to offshore transport of dissolved inorganic carbon and evaluate the air-sea CO<sub>2</sub> fluxes for a current state of the California upwelling system (CUS). To this end, we use highly resolved regional simulations from a coupled physical-biogeochemical model of the CUS.



### Alison Webb

**Email:** Alison.l.webb@uea.ac.uk

**Institute:** University of East Anglia, Norwich, UK

**Poster Title:** The effects of ocean acidification on trace gas concentrations during an open-water mesocosm experiment

**Poster Abstract:** Recently, a large-scale mesocosm experiment was carried out in Bergen, Norway, to further investigate the effects of ocean acidification on the chemistry and biology of surface waters. The concentrations of several trace gases important for climate regulation are affected by these pH changes and the subsequent effects on phytoplankton community structure. An overview of the data collected during the mesocosm experiment is presented.



### Florian Wetzel

**Email:** wetzel@erdw.ethz.ch

**Institute:** ETHZ, Zürich, Switzerland

**Poster Title:** Diatom Si isotope variations from the Atlantic sector of the Southern Ocean (ODP Site 1093) record environmental changes of the last 170 ka.

**Poster Abstract:** Si isotope variations in diatoms can be linked to the efficiency of the biological pump, which determines whether the ocean is a net source or sink for atmospheric CO<sub>2</sub>. Data from the South Atlantic suggest that major changes in the efficiency of the biological pump occurred during glacial terminations.



### Jin-Yu 'Terence' Yang

**Email:** jyyang@xmu.edu.cn

**Institute:** State Key Laboratory of Marine Environmental Science, Xiamen, China (Beijing)

**Poster Title:** Couple nitrogen and oxygen isotope measurements of nitrate in the South China Sea

**Poster Abstract:** To better constrain the nitrogen cycling in the water column and the potential role of  $N_2$  fixation in supplying the newly fixed N, we present a new nitrate isotopes data in the northern basin of South China Sea (SCS), a largest marginal sea featured with oligotrophic nature in the upper mixed layer.



### Han Yu

**Email:** hanyu1002@gmail.com

**Institute:** Ocean University of China, Qingdao, China (Beijing)

**Poster Title:** Distributions and sea-to-air fluxes of nitrous oxide in the coastal waters of northern South China Sea

**Poster Abstract:** Distributions and fluxes of  $N_2O$  in the coastal waters of North South China Sea were determined during the four surveys from 2007 to 2009. In this poster, we showed the horizontal and vertical distributions and seasonal variations of dissolved  $N_2O$  in this area.



### Julia Zabori

**Email:** julia.zabori@itm.su.se

**Institute:** Stockholm University, Sweden

**Poster Title:** Changes in sea spray production with changes in physical properties of Arctic Ocean water at 79°N – Laboratory experiments

**Poster Abstract:** Over the last decades an enhanced change in air temperature in the Arctic was observed. It is examined in how far the resulting change in water temperature, salinity and oxygen saturation is influencing the primary marine particle number concentration and number size distribution. It seems that water temperature has a dominating effect.

## LECTURERS, DEMONSTRATORS + ORGANISING COMMITTEE



### Carole Barus

**Demonstrator**

**Email:** carole.barus@legos.obs-mip.fr

**Institute:** LEGOS, Toulouse, France

**Practical Title:** Laboratory

**Biography:** Carole Barus completed her Ph. D. in the Chemical Engineering Laboratory (LGC) in Toulouse (France) in collaboration with a French pharmaceutical company. The aim of her research was to develop electrochemical tools and methods in order to help the formulation of new creams containing antioxidant molecules. After obtention of her Ph. D, she worked for 3 months in Loughborough, England, as a research engineer where they developed a new glucose biosensor using reverse iontophoresis process. She is currently a research engineer within the French National Scientific Research Council (CNRS) and the Laboratory of Space Geophysics and Oceanography (LEGOS) in Toulouse, where they are developing an autonomous electrochemical sensor for the detection and quantification of dissolved nutrients concentrations in the ocean. The detection is based on an electrochemical detection on a gold electrode after complexation between silicates or phosphates and molybdates created *in situ* by oxidizing molybdenum metal.

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### Rachael Beale

**Demonstrator**

**Email:** rbea@pml.ac.uk

**Institute:** Plymouth Marine Laboratory, UK

**Practical Title:** Gas Exchange

**Biography:** Rachael Beale works as a senior analytical chemist at Plymouth Marine Laboratory. Since starting at PML, she has been developing methods to extract Oxygenated Volatile Organic Compounds (OVOCs) from seawater. In 2009, she deployed the instrumentation on two research cruises and successfully measured ethanol and propanol in seawater for the first time. She is particularly interested in the air-sea exchange of OVOCs and the oceanic mechanisms influencing their production and destruction. She has substantial experience in coupling water analyses with analytical instrumentation and a keen interest in both spectroscopy and chromatography. She attended the SOLAS summer school in 2009 as a student and is here this year to assist with the gas exchange practical session.



## Mike Behrenfeld

**Lecturer**

**Email:** mjb@science.oregonstate.edu

**Institute:** Oregon State University, Corvallis, USA

**Lecture Titles:** Remote sensing I & II

**Biography:** Professor Mike Behrenfeld received his Ph.D. in bio-optical oceanography from the College of Oceanographic and Atmospheric Science at Oregon State University. He then did post-doctoral work with Dr. Paul Falkowski at the Brookhaven National Laboratory, New York. He remained at Brookhaven until taking a research position at Rutgers University in New Jersey. Shortly thereafter, he began working for the National Aeronautics and Space Administration in Washington DC and remained with NASA until 2005, when he moved to Oregon State University. He is currently a professor at OSU in the Department of Botany and Plant Pathology. Professor Behrenfeld's research is focused on phytoplankton ecology and physiology. His work transcends a broad range of scales, from the subcellular/biochemical to the planetary. Primary themes of his research include the role of iron stress on ocean productivity and its physiological consequences, developing novel applications of satellite remote sensing data for understanding plankton dynamics, basic research on the light and carbon fixation reactions of photosynthesis, and development of new technologies for field applications and future satellite missions.



## Laurent Bopp

**Lecturer + Practical Leader**

**Email:** laurent.bopp@cea.fr

**Institute:** LSCE IPSL, Gif-sur-Yvette, France

**Practical Title:** Remote Sensing

**Lecture Titles:** Greenhouse gases and climate change & The global carbon cycle

**Biography:** Laurent Bopp is a research fellow at the CNRS since 2003, at the Laboratoire des Sciences du Climat et de l' Environnement (LSCE / IPSL). He specializes in the interactions between marine biogeochemistry and the climate system. In particular, he worked on modeling the impact of climate change on marine productivity and carbon cycling in the ocean. He is author or co-authored over 60 publications in peer-reviewed journals and authors of several popular science articles. He is involved in the drafting of the next IPCC report. He is responsible for the LSCE Marine Biogeochemistry and Climate team (15 people) and members of several bodies or national or international committees.



## Phil Boyd

**Lecturer + Practical Leader**

**Email:** pboyd@alkali.otago.ac.nz

**Institute:** University of Otago, Dunedin, New Zealand

**Practical Title:** Laboratory

**Lecture Titles:** The iron cycle; Macronutrients in the ocean; Atmospheric and oceanic time series observations & Scientists and the Press

**Biography:** Philip Boyd is a phytoplankton ecologist with the National Institute of Water and Atmosphere in New Zealand. He has been based, for 15 years, at a joint NIWA/University of Otago research centre at the Department of Chemistry in Dunedin. Phil's areas of interest are iron biogeochemistry, phytoplankton responses to climate change, and the working of the biological pump - a coupling between the surface and the subsurface ocean. He has been involved in several major SOLAS activities, such as leading the C-SOLAS mesoscale iron-enrichment (SERIES) in the NE Pacific and the NZ-SOLAS mesoscale study of the iron biogeochemistry of unperturbed high-nutrient, low-chlorophyll waters south of New Zealand. He has participated in all of the SOLAS summer schools and is currently collaborating with scientists at UEA (UK) on the development of a global ship of- opportunity dust sampling program.



## Emilie Brévière

**Lecturer + SOLAS Executive Officer**

**Email:** ebreviere@ifm-geomar.de

**Institute:** SOLAS International Project Office, IFM-GEOMAR, Kiel, Germany

**Lecture Title:** Organisation of science

**Biography:** Emilie Brévière holds a French engineering diploma in chemistry and chemical engineering from the Ecole Nationale Supérieure de Chimie de Mulhouse, and post-graduate in meteorology, oceanography and environmental sciences. She carried out her PhD at the university Pierre et Marie Curie in Paris. Her work encompassed the temporal variability of air-sea CO<sub>2</sub> fluxes in the Southern Ocean. She then joined the SOLAS International Project Office (IPO) as Project Officer, and following a secondment with the International Geosphere Biosphere Programme (IGBP) as Deputy Director in Natural Sciences she returned to the IPO as Executive Officer.



### Andrew Dickson

**Practical Leader**

**Email:** adickson@ucsd.edu

**Institute:** Scripps Institution of Oceanography, San Diego, CA, USA

**Practical Title:** Gas-Exchange

**Biography:** Andrew Dickson is a Professor of marine chemistry in the Marine Physical Laboratory division at the Scripps Institution of Oceanography, University of California, San Diego (UCSD). Andrew's research focuses on improving our understanding of the chemistry of carbon dioxide in seawater, with a current emphasis on the effects of ocean acidification. He has played a key role in developing quality control standards for oceanic carbon dioxide measurements and leads a program to prepare, certify, and distribute CO<sub>2</sub> reference materials to the world's marine scientists. He has been affiliated with Scripps since 1983. Dickson's laboratory participates in hydrographic cruises sponsored by the CLIVAR project. He is also part of a multi-institutional collaboration to study the implications of ocean acidification on a variety of organisms that are important to US West Coast fisheries, a member of the OceanSITES Data Management Team and the PICES Section on Carbon and Climate and chairman of the steering committee for the California Current Acidification Network.



### Lionel Fichen

**Demonstrator**

**Email:** lionel.fichen@ifremer.fr

**Institute:** IFREMER, Brest, France

**Practical Title:** Cruise

**Biography:** Lionel Fichen is Assistant Engineer working on the technical team for the CNRS (French National Centre for Scientific Research). His team is responsible for the national pool of oceanographic instruments. Their main duty is the maintenance and testing of these instruments that are loaned to CNRS scientists during their experiments. They supply a suite of common instruments used for oceanographic research: CTDs, current meters, water samplers, ARGOS beacons, sediment traps, floatation, acoustic release, corers, etc. Lionel's tasks include the planning, purchase and testing a wide range of sensors to check they are working safely and efficiently prior to deployment. He is skilled in the use of different engineering techniques like computing, electronic and mechanical design. His tasks also include participating in several cruises every year in order to deploy or recover moorings and perform CTD casts.



### Eric Galbraith

**Lecturer**

**Email:** eric.galbraith@mcgill.ca

**Institute:** McGill University, Montreal, Canada

**Lecture Titles:** Biogeochemical changes over long time-scales

**Biography:** Eric Galbraith, a native of Halifax, Canada, completed an undergraduate degree in geology at McGill University in 1997. He then worked in mineral exploration in the arctic and Peru, as a writer for the David Suzuki Foundation (an environmental non-profit), and as a polar expedition tour guide, before embarking on doctoral studies in oceanography at UBC. His thesis looked at glacial-interglacial changes in the marine nitrogen cycle, using a combination of seafloor sediment analysis, seagoing measurements, and ocean-biogeochemistry models. He then did three years of postdoctoral work at Princeton University, developing and experimenting with global Earth system models. Meanwhile, he has participated in many educational cruises to the Arctic and Antarctic as an educator and zodiac driver. He has been an assistant professor at McGill University since 2009.



### Véronique Garçon

**Lecturer, Practical Leader and Summer School Co-ordinator**

**Email:** Veronique.garcon@legos.obs-mip.fr

**Institute:** CNRS LEGOS/GRGS, Toulouse, France

**Practical Title:** Cruise

**Lecture Titles:** Introduction to SOLAS & Oceanic biogeochemistry modelling

**Biography:** Véronique Garçon's expertise includes coupled physical/biogeochemical modelling, and marine biogeochemistry. Véronique graduated with a PhD degree in 1981 in Environmental Sciences (Energy and Pollutions) from University Paris VII. She defended an "Habilitation à Diriger des Recherches" in Oceanography in 1995 at University Paul Sabatier, Toulouse. She integrated CNRS in 1985 at the Institute of Physics of the Globe after a postdoctoral experience at MIT. She has been a Senior Scientist since 1998 at LEGOS (Laboratory of Space Geophysics and Oceanography) and is leading the Physical Dynamics/Marine Biogeochemistry Group. Her research interests include marine biogeochemistry and ecosystem dynamics, large scale ocean circulation and tracers, global carbon and nitrogen cycles, physical-biological interactions, eastern boundary upwelling systems and biogeochemical climatic monitoring.



### Martin Johnson

**Demonstrator**

**Email:** martin.johnson@uea.ac.uk

**Institute:** University of East Anglia, Norwich, UK

**Practical Title:** Gas-Exchange

**Biography:** Martin Johnson is a biogeochemist and Earth-system scientist with particular interest in the production and release of trace gases from the surface ocean, and the global biogeochemical cycle of nitrogen. He is currently working on constraining the uncertainties which are commonly overlooked when estimating gas exchange (e.g. microlayer effects, chemical enhancement) especially for reactive trace gases; and studying nitrogen cycling in the North sea. He likes measuring things and modelling them too! He is an advocate for the open science movement and keeps an open lab notebook at <http://www.uea.ac.uk/~e356/>.



### Maria Kanakidou

**Lecturer**

**Email:** mariak@chemistry.uoc.gr

**Institute:** University of Crete, Heraklion, Greece

**Lecture Titles:** Atmospheric chemistry I & II

**Biography:** Maria Kanakidou is Professor at the Environmental Chemical Processes Laboratory of the Chemistry Department at the University of Crete with Habilitation in Chemistry. She has expertise on atmospheric chemistry and physics with focus on the environmental and climate impact of organic compounds, ozone and aerosols in the troposphere; both on experimental and modelling studies. She investigates the human-driven changes and feedbacks in atmospheric chemistry, the biogeochemical cycles and their interactions with climate. She is recipient of the H. Julian Allen Award in 1998, contributes to/reviewer of the WMO/IPCC reports, has more than 75 publications in peer reviewed journals. She is member of the International Commission on Atmospheric Chemistry and Global Pollution (iCACGP, served as President during 2006-2010) and the Group of Experts on Scientific Aspects of Marine Environmental Protection (GESAMP) WG 38 on 'The Atmospheric Input of Chemicals to the Ocean' since 2008.



### Stefan Konradowitz

**SOLAS Project Officer**

**Email:** skonradowitz@ifm-geomar.de

**Institute:** SOLAS International Project Office, IFM-GEOMAR, Kiel, Germany

**Biography:** Stefan Konradowitz was born and raised near Kiel, Germany. After graduating from the University of Kiel in 2009 with a Degree in Physical Geography, he shortly worked for a space science journal before taking a job as a Research Assistant at the IFM-GEOMAR. Since February 2011, he has become a Project Officer for SOLAS working in the International Project Office at IFM-GEOMAR. He is mainly concentrating on planning and organising the next SOLAS Open Science Conference in 2012 as well as supporting the day-to-day work of the IPO.



## Corinne Le Quéré

**Lecturer + Practical Leader**

**Email:** c.lequere@uea.ac.uk

**Institute:** Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, UK

**Practical Title:** Oral & Communication

**Lecture Title:** The IPCC Process

**Biography:** Corinne Le Quéré is Professor of Climate Change Science and Policy at the University of East Anglia and Director of the Tyndall Centre for Climate Change Research. She conducts research on the interactions between climate change and the carbon cycle. Prof Le Quéré was author of the 3rd, 4th and 5th (ongoing) Assessments of the Intergovernmental Panel on Climate Change (IPCC) and of the Millennium Ecosystem Assessment. She co-Chairs the Global Carbon Project, a non-governmental organization that fosters International research on the carbon cycle and publishes annual updates global emissions and sinks of carbon dioxide. Prof Le Quéré is originally from Canada. She completed a Ph.D. in oceanography in University Paris VI (1999), an M.S. in Atmospheric and Oceanic Sciences from McGill University and a B.Sc. in physics from University of Montréal. She has conducted research at Princeton University in the United States and at the Max-Planck Institute for Biogeochemistry in Germany.



## Maurice Levasseur

**Lecturer**

**Email:** Maurice.levasseur@bio.ulaval.ca

**Institute:** Université Laval, Québec, Canada

**Lecture Title:** Marine ecology I: Phytoplankton and primary production & Marine ecology II: Bacterioplankton, respiration and other microbial processes

**Biography:** Maurice Levasseur obtained a BA. in Biology and a MSc. in Marine Biology at University Laval, and a Ph.D. in Oceanography at the University of British Columbia, Canada. He then researched as Head of the Primary Production Section at the Maurice Lamontagne Institute of Fisheries and Oceans Canada. Trained as an algal ecophysiologicalist, he soon became curious – and then addicted – to the intricate role of planktonic organisms on the oceanic production of the climate-active gas DMS. In 2002, he moved to University Laval to hold the Canada Research Chair on Plankton-Climate Interactions and took the leadership of the Quebec-Ocean Research Centre. During recent years, he has become chair of the Canadian SOLAS Network, chaired the Arctic SOLAS program (2008-2011) and the joint Québec-China research program on the impact of Asian dust on the Northeast Subarctic Pacific. His current interests are on the impact of ice and freshwater on the production of DMS and N<sub>2</sub>O in the Arctic (ArcticNet and Arctic-ICE programs) and on the impact of volcanic ash and acidification on the biogeochemistry of the Northeast Pacific.



### Peter Liss

**Lecturer + Practical Leader**

**Email:** p.liss@uea.ac.uk

**Institute:** University of East Anglia, Norwich, UK

**Practical Title:** Gas Exchange

**Lecture Titles:** Trace gases in ocean and atmosphere

**Biography:** Peter Liss has been based in the School of Environmental Sciences at the UEA for the past 40 years, researching and teaching many aspects of environmental chemistry. In particular, his research has focused on the biogeochemical interactions between the ocean and the atmosphere, specialising in the processes of air-sea gas exchange, the mechanisms of trace gas formation in the oceans, and their reactivity and role in the atmosphere. Peter's research group is an integral part of the School's Laboratory for Global Marine and Atmospheric Chemistry (LGMAC). Peter received the Challenger Society Medal, the Plymouth Marine Sciences Medal, and the John Jeyes Medal of the Royal Society of Chemistry. He also served for 5 years on the Natural Environment Research Council, was Chair of the Scientific Committee of the International Geosphere-Biosphere Programme, and Chair of the Scientific Steering Committee for the international SOLAS Project and is currently Chair of the Royal Society's Global Environment Research Committee.



### KK Liu

**Lecturer**

**Email:** kkliau@ncu.edu.tw

**Institute:** Institute of Hydrological and Oceanic Sciences, National Central University, China (Taipei)

**Lecture Title:** Processes in the coastal zone: Biogeochemistry and hydrology I&II

**Biography:** Commonly known as KK, Kon-Ke Liu is a professor at the Institute of Hydrological and Oceanic Sciences, National Central University in Taiwan. His current research focus is to explore biogeochemical cycles in continental margins using observational and modelling approaches. Originally, KK trained at UCLA as an isotope geochemist, specializing in stable isotopes of nitrogen. After returning to Taiwan in 1981, he had organized large field campaigns under the Kuroshio Edge Exchange Processes (KEEP) project and the South-East Asian Time-series Study (SEATS) exploring biogeochemistry in the East and South China Seas. Basing on his research experiences, he advocated the significance of continental margins in global biogeochemical cycles, while serving on various committees of IGBP. In the past decade he led the editing of a book, "Carbon and Nutrient Fluxes in Continental Margins: A Global Synthesis", which was published in the series of Global Change Books of IGBP by Springer in 2010.



### Kath Mortimer

SOLAS Project Officer

Email: k.mortimer@uea.ac.uk

Institute: University of East Anglia, Norwich, UK

**Biography:** After completing her BSc in Biological Sciences in 2001, Kath worked as a Research Assistant at the John Innes Centre, UK, for several years before pursuing a career in Scientific Project Management and Communication. She spent 3 years working for the Norwich Research Park as a Science Liaison Manager where she promoted cross disciplinary collaboration and commercial spin out projects as well as managing conferences and studentship programmes. After taking some time out to travel, Kath worked in public relations before joining SOLAS as Project Officer in early 2010. As well as working on the SOLAS Summer School 2011 and SOLAS Open Science Conference Kath co-ordinates COST Action 735 activities, SOLAS newsletters, e bulletins and the SOLAS websites.



### Phil Nightingale

Lecturer & Practical Leader

Email: pdn@pml.ac.uk

Institute: Plymouth Marine Laboratory, UK

Practical Title: Gas Exchange

Lecture Titles: Air-water gas exchange I & II

**Biography:** Phil Nightingale's research is based around the identification and subsequent quantification of production and/or removal rates of trace gases (DMS/P and halocarbons and more recently OVOCs) in seawater in the oceans and their transfer across the air-sea interface. He has worked extensively on the use of deliberate tracers ( $\text{SF}_6$ ,  $^3\text{He}$ , rhodamines and spores) to determine air-sea gas exchange rates, in pioneering in-situ iron fertilisation experiments and as Lagrangian tracers for studies of trace gas cycling and biogeochemistry in coastal seas, upwelling areas and the open oceans. He has published over 50 peer-reviewed papers, has extensive experience. In the analysis of trace gases (e.g. VICs,  $\text{SF}_6$  and DMS) and have participated in over 30 field experiments, often with international colleagues (IronEx1&2, EisenEx, ASGAMAGE, DOGEE, EPOCA). He has lectured at the SOLAS Summer Schools in 2007 and 2009. He is presently the Head of Science for Biogeochemistry at PML.



## Aurélien Paulmier

**Demonstrator**

**Email:** aurelien.paulmier@legos.obs-mip.fr

**Institute:** CNRS LEGOS/GRGS, Toulouse, France

**Practical Title:** Cruise

**Biography:** Aurélien Paulmier is researcher (IRD) at the LEGOS (Toulouse), after a National Service as research engineer (Chile), a PhD (Paris VI) and several post-docs (e.g. IFM-Geomar, Kiel; MPI, Bremen). He is currently working in cooperation in Lima (Peru) for 2 years. Since 1999-2000, his research aims to understand the impact and feedback effects of climate change on marine biogeochemistry, focussed on the Oxygen Minimum Zones (OMZs) and on carbon, nitrogen and oxygen cycles. His investigation and activities contribute to develop the large topic of the ocean deoxygenation, with 9 publications on the OMZs including a review (Progress In Oceanography, 2008), and from complementary approaches (*in situ* observations with a strong experience at sea; experiments; data analysis; modeling). He initiated a SOLAS mid-term strategy ("white paper") and is organizing international workshop and conference in order to stimulate the debate and to coordinate international actions concerning the role of the OMZs.



## Alberto Piola

**Lecturer + Practical Leader**

**Email:** apiola@hidro.gov.ar

**Institute:** Servicio de Hidrografia Naval, Buenos Aires, Argentina

**Practical Title:** Laboratory

**Lecture Titles:** Introduction to ocean physics & Climate change and variability

**Biography:** Alberto R. Piola is a Professor of Oceanography at Buenos Aires University and Research Director at the Oceanography Department of the Naval Hydrographic Office in Buenos Aires, Argentina. He was a Visiting Investigator at the Woods Hole Oceanographic Institution, Woods Hole, MA, and at the Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY. His research interest is focused on the physical processes which sustain productive ocean regions and the role of the ocean on the global climate and its evolution as a response of climate change. Has published over 70 refereed research articles and book chapters and two Oceanographic Atlases. He led research cruises carried out in the North Atlantic, South Atlantic and Southern Oceans. Currently is a member of the Ocean Observation Panel for Climate (OOPC/UNESCO), the Scientific Steering Committee of the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER/IGBP-SCOR) and the Aquarius Science Team (NASA/CONAE) and the Scientific Committee of l' Institut franco-argentin d' Études sur le Climat et ses Impacts (CNRS/CONICET).



### Eric Saltzman

Lecturer + Practical Leader

Email: [esaltzma@uci.edu](mailto:esaltzma@uci.edu)

Institute: University of California, Irvine, USA

Practical Title: Oral and Communication

Lecture Titles: Ethics in science; Introduction in marine aerosols & Atmospheric and oceanic time series observations

**Biography:** Eric Saltzman is an atmospheric chemist whose research involves the biogeochemical cycling of trace gases and their relationship to climate change. His research involves air/sea gas exchange, halogen photochemistry, and analysis of polar ice cores. Dr. Saltzman has published more than 100 scientific articles. He received a BS in Geology from the University of Rochester and MS and PhD degrees in Oceanography from the University of Miami. He is co-chair of US SOLAS, and recently become Chair of International SOLAS. He is also a Fellow of the AGU, has served as NSF Program Manager for Atmospheric Chemistry, and chaired two University Departments. He is currently a Professor in the Department of Earth System Science at the University of California, Irvine.



### Lionel Scouarnec

Demonstrator

Email: [lscouarn@ifremer.fr](mailto:lscouarn@ifremer.fr)

Institute: IFREMER, Toulouse, France

Practical Title: Cruise

**Biography:** Lionel Scouarnec is an assistant engineer at the Technical Division of INSU. In the National Instrumentation Oceanographic team, he is in charge of maintenance and monitoring of oceanographic equipment including recoverable transponders, acoustic releases, interface coring and optical sensors. He designs mooring lines (sub-surface and drifting lines) and all mechanical devices. He has participated in the preparation of many missions ( $\sim 30\text{yr}^{-1}$ ) for the French oceanographic community and also participates in cruise at sea. In addition to my activities in the oceanographic team, he participates in the preparation of about twenty drifters PROVOR. This represents the participation in technical support of the INSU for the CORIOLIS project.



## Roland von Glasow

Lecturer + Practical Leader

Email: r.von-glasow@uea.ac.uk

Institute: University of East Anglia, Norwich, UK

Practical Title: Atmospheric Chemistry

Lecture Titles: Atmospheric modelling

**Biography:** Roland von Glasow is a Reader in Atmospheric Chemistry at the School of Environmental Sciences, University of East Anglia in Norwich, UK. He studied atmospheric physics in Mainz, Germany and received his PhD in 2001 (Max-Planck-Institute for Chemistry in Mainz, Germany). After two years as a postdoc at the Scripps Institution of Oceanography in San Diego, USA, he led an independent Junior Research Group at the Institute of Environmental Physics at the University of Heidelberg, Germany before he moved to UEA in 2007. The work of his group focuses on tropospheric halogen chemistry (marine boundary layer, polar regions, volcanoes, salt lakes, free troposphere), links between halogen and sulphur chemistry, the background chemistry of the marine boundary layer, and chemistry-cloud-climate in the marine boundary layer. He is a member of the Scientific Steering Committee of SOLAS and a co-chairman of the SOLAS/IGAC task Halogens in the Troposphere (HitT).



## Juergen Weichselgartner

Lecturer

Email: j.weichselgartner@loicz.org

Institute: Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

Lecture Title: What is excellent Science?

**Biography:** Juergen Weichselgartner: born 1968 in Aalen, Germany. Studied geography, political science, ethnology in Heidelberg, Malta, Santander and Bonn, M.Sc. 1997; 1999-01 Marie Curie Fellowship, University of Cantabria (Spain); PhD 2001 in Bonn with a system-theoretical analysis of the social discussion of natural risks, awarded by the Franzke'sche Foundation Berlin; 2002-04 Marie Curie Fellowship, International Institute for Applied Systems Analysis (IIASA) (Austria); 2004-06 JSPS Fellowship, Tokyo University (Japan); 2006/07 Humboldt Fellowship, Harvard University (USA), 2010/11 NSC Fellowship, National Taiwan Normal University (Taiwan); since 03-07 Senior Science Coordinator of LOICZ, Helmholtz-Zentrum Geesthacht; Several research projects, secretary of the International Geographical Union's Commission „Hazards and Risks“, reviewer and consultant for international journals, IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), European Commission, IDB, GTZ. Scientific activities: natural hazard and global change research, risk and disaster management, knowledge systems and science communication.

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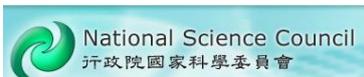
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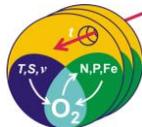
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