3rd CLIVAR-FIO Summer School on Biogeochemical Processes in Earth System Models (Time Zone: GMT+8)

Venue: Blue Horizon Yu Hua Hotel (Qingdao Golden Beach Blue Ocean Yuhua Hotel)

Opening Ceremony & Class in Room 506 (5F)

Time	Activities	Speaker/Chair
Monday 15 July 2024		
09:00-09:35	**Opening Ceremony**	**Chaired by Qian Zhao**
	Opening remarks from FIO and Organizing Committee	**Fangli Qiao**
	Opening remarks from Organizing Committee	**Peter Strutton**
	Opening remarks from the World Climate Research Programme	**Hindumathi Palanisamy**
	Opening remarks from CLIVAR Scientific Steering Group	**Sonya Legg**
	Opening remarks from lecturer representative	**Sayaka Yasunaka**
	Opening remarks from lecturer representative	**Jerry Tjiputra**
	Introduction to the CLIVAR-FIO Summer School and logistic information	**Agus Santoso**
09:35-10:20	**Training Lecture 1:** An introduction to BGC and its role in climate	**Peter Strutton**
10:20-10:35	**Discussion**	
10:35-11:05	**Health break & Group photo**	
11:05-11:50	**Training Lecture 2:** Overarching scientific issues in ESMs	**Fangli Qiao**
11:50-12:00	**Discussion**	
12:00-14:00	**Lunch**	
14:00-14:45	**Training Lecture 3:** BGC processes and observations **Air-sea CO2 flux in the global ocean, Nutrient variability in the surface ocean**	**Sayaka Yasunaka**
14:45-15:00	**Discussion**	
15:00-15:30	**Health break**	
15:30-16:15	**Training Lecture 4:** Earth System Models **Ocean biogeochemical cycle representation in Earth System Models**	**Jerry Tjiputra**

16:15-16:30	**Discussion**	
16:30-17:30	Participants lightning talks	**All students & teachers**
Tuesday 16 July 2024		
09:00-09:50	**Training Lecture 5:** BGC processes and observations **Ocean color, data assimilation**	**Remote: Cecile Rosseaux, Lionel Arteaga**
09:50-10:10	**Discussion**	**Cecile, Lionel**
10:10-10:50	**Health break**	
10:50-11:40	**Training Lecture 6:** Physical Oceanography, climate processes **Ocean circulations and climate: Part 1 (Ekman transport, geostrophic flow, wind driven circulation)**	**Sayaka Yasunaka**
11:40-12:00	**Discussion**	**Sayaka Yasunaka**
12:00-14:00	**Lunch**	
14:00-14:50	**Training Lecture 7:** Topical **Ocean biology-induced heating effects and their interactions with El Nino-Southern Oscillation**	**Ronghua Zhang**
14:50-15:10	**Discussion**	
15:10-15:30	**Health break**	
15:30-16:30	**Data analysis lab:** The representation of primary productivity in models and satellite algorithms, part 1 of 3. requires MATLAB in each laptop (and the mapping tool)	**Tyler Rohr, Peter Strutton**
16:30-17:30	**Work on Proposals**	**Groups**
Wednesday 17 July 2022		
TBD-09:00	**Depart from hotel**	**All students & volunteers**
09:00-12:00	**Excursion to Research Vessels**	**All students & volunteers**
12:00-14:00	**Return to hotel & lunch**	
14:00-14:45	**Training Lecture 8:**	**Peng Xiu**

	BGC Modelling **Modeling biogeochemical processes in the ocean**	
14:45-15:00	**Discussion**	
15:00-15:30	**Practice session** requires MATLAB in each laptop	
15:30-15:50	**Health break**	
15:50-16:30	**Training Lecture 9:** Science talk	**Peng Xiu**
16:30-17:30	**Training Lecture 10:** Physical Oceanography, climate processes **Ocean circulations and climate: Part 2 (Ekman transport, geostrophic flow, wind driven circulation) + worksheets**	**Sayaka Yasunaka**
Thursday 18 July 2022		
09:00-09:50	**Training Lecture 11:** BGC processes and observations **Biogeochemical cycling of methane in marine environments**	**Guangchao Zhuang**
09:50-10:10	**Discussion**	
10:10-10:50	**Health break**	
10:50-11:40	**Training Lecture 12:** Topical/case studies **The state and future of zooplankton grazing in ESMs**	**Remote: Tyler Rohr**
11:40-12:00	**Discussion**	
12:00-14:00	**Lunch**	
14:00-14:50	**Training Lecture 13:** Topical/case studies **Uncertainties in ocean biogeochemical projections and how to constrain them**	**Jerry Tjiputra**
14:50-15:10	**Discussion**	
15:10-15:30	**Health break**	
15:30-16:30	**Data analysis lab:** The representation of primary productivity in models and satellite algorithms, part 2 of 3.	**Peter Strutton, Tyler Rohr**
16:30-17:30	**Work on Proposals**	**Groups**
Friday 19 July 2022		
09:00-09:50	**Training Lecture 14:**	**Remote:**

	BGC processes and observations **Internal vs External Drivers of Ocean Biogeochemical Dynamics from Global to Meso Scales**	**Yassir Eddebbar**
09:50-10:10	**Discussion**	
10:10-10:50	**Health break**	
10:50-11:40	**Training Lecture 15:** **Ocean acidification and CO2 removal**	**Peter Strutton**
11:40-12:00	**Discussion**	
12:00-14:00	**Lunch**	
14:00-15:30	**Journal article review and breakout discussion**	**Ivonne Montes**
15:30-16:00	**Health break**	
16:00-17:00	**Data analysis lab:** The representation of primary productivity in models and satellite algorithms, part 3 of 3.	**Peter Strutton, Tyler Rohr**
17:00-18:00	**Work on Proposals**	**Groups**
18:30-21:00	**Farewell Dinner**	**All trainees and teachers**
Saturday 20 July 2022		
09:00-11:00	**Proposal presentations (10 mins each group + 5 mins discussions)**	**Groups**
11:00-11:30	**Health break**	
11:30-12:00	**Closing ceremony**	