

Pre-Workshop preparation:

All participants are asked to engage in discussions, brainstorms, writing or synthesizing during the workshop. At the end of the week, we hope to have compiled and condensed all our critical thinking into a white paper that outlines what we believe are the most important challenges and scientific questions. There are a number of primers during the first two days designed to make everyone familiar with the different fields of expertise. However, some preparation ahead of time may be done (although entirely optional - we know you are busy!)

- **Reader:** a reader with key papers from the different fields of expertise will be provided to the participants to review before or while traveling to the workshop.
- **Key questions** If you have time, you are encouraged to think of the following questions ahead of time, although some individual thinking time is also scheduled during the workshop:
 - What are the main scientific questions regarding critical processes or mechanisms in (sub)mesoscale air-sea coupling that we should understand?
 - What are gaps and opportunities in our ability to observe, model or parameterize such processes/mechanisms in air-sea coupling? How can we promote a more holistic approach that combines observations and models?
- **Poster and lightning talk (instructions)** There are very few presentations during the workshop, yet we would like to learn about research finding(s) that you deem really interesting and relevant in the context of the workshop theme, that intrigue you or that you don't understand (but think we should). All of you - including keynote speakers and lecturers - are encouraged to bring a poster that highlights some recent or old results. They don't need to be published. The poster sessions are on Monday and Tuesday, and can be introduced with 1-2 minute pitches (lightning talks) if you wish.

Poster format: A0 / portrait.

Lightning talk: 1 slide, introduced by yourself in about ~ 1-2 minutes.

During the Workshop:

- **Scientific activities:**
 - Plenary discussions
 - Breakout discussion and writing sessions
 - Inspiring keynotes and public lecture at the end of the day
 - Crash courses in atmospheric or oceanic processes, in parameterization, modeling or observation of air-sea interaction
 - Posters are up all week with a dedicated session on Monday and Tuesday
- **Social activities:**
 - Wine & Cheese event
 - Catered lunches in groups: early career meet senior scientists, women in science.
 - Boat tour on the Kager lakes with Oriental Workshop Dinner/Buffer
 - Pizza Night followed by public lecture in Naturalis Biodiversity Center

Post-Workshop activities:

- Finalize white paper
- Online follow-up meetings

MONDAY	Activity	Speaker/moderator	Duration
9.30 – 10.00	Arrival, registration and coffee		
10.00 – 10.15	Welcome and introduction by the Lorentz Center		15 min
10.15 – 10.30	Opening, schedule and objectives	Louise Nuijens	15 min
10.30 – 11.30	Introduction round: Where is (y)our expertise?		1 hr
11.30 - 11.45	Individual thinking time: write down key questions		15 min
	Crash courses on air-sea coupling: Air-sea interactions		
11.45 – 12.30	A) Air-sea interactions: sea-side processes	Bia Villas Boas	45 min
12.30 – 13.45	Lunch Break, catered @Oort / Assigned lunch groups: Early career meet senior participants		75 min
13.45 – 14.30	B) Air-sea interactions: air-side processes	Ehud Strobach	45 min
14.30 – 15.00	Perspectives from the recent CLIVAR workshop on Mesoscale and Frontal-Scale Air-Sea Interactions	Larry O'Neill	20 min + 10 min Q&A
15.00 – 15.30	Coffee Break		30 min
15.30 – 16.00	PLENARY: Logging (individual) key questions in tool, Wrap up of the day	Louise/Jacob	30 min
16.00 – 17.00	Lightning talks: introduce your poster through 'an intriguing figure'		60 min
17.00 - 19.00	Poster session I		
17.30 - 19.00	Wine & Cheese served		

TUESDAY	Activity	Speaker/moderator	Duration
9.00 – 9.15	Day opening and objectives	Louise Nuijens	15 min
9.15 – 9.45	PLENARY: Upvoting of key questions in tool, Discussion	Louise/Jacob	45 min
9.45 - 10.15	Individual thinking: write down challenges related to measurements, modeling and parameterization, issues in concepts or terminology	Louise/Jacob	15 min
10.15 - 10.45	Coffee Break		30 min
10.45 - 12.15	Crash courses on approaches to couple air-sea processes in models		1,5 hrs
	A) Bulk/stochastic parameterizations	Momme Hell	
	B) High-resolution coupled modeling approaches	Lionel Renault	
12.15 – 13.30	Lunch Break, catered @Oort / Assigned lunch group: Women In Science		75 min
13.30 - 15.00	Crash courses on what we can, cannot and could possible observe (for modelers)	Paco Lopez Dekker, Ad Stoffelen, Fabrice Ardhuin	1,5 hrs
	A) Remote sensing B) in-situ measurements:		
15.00 – 16.00	Coffee Break & Poster session II		60 min
16.00 – 16.45	PLENARY: Upvoting of challenges in methods and issues in concepts, Discussion	Paco Lopez Dekker	45 min

16.45 - 17.00	Wrap up of the day	Louise/Jacob	15 min
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17.00 – 17.45	KEYNOTE: Title TBD	Bjorn Stevens	45 min
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Free Evening

WEDNESDAY	Activity	Speaker/moderator	Duration
9.00 – 9.15	Day opening and objectives	Louise	15 min
9.15 - 10.15	PLENARY session: Which grand challenges/overarching themes can we identify? Discuss and converge	Claudia Pasquero, Larry O'Neil	60 min
10.15 – 10.45	Coffee Break		30 min
10.45 – 12.00	BREAK OUT GROUPS: Smaller groups brainstorm on key questions within themes, and challenges to address in available methods		75 min
12.00 - 13.30	Lunch Break, walk over to canteen		1,5 hrs
13.30 - 15.00	BREAK OUT GROUPS (continued) Write key points, a figure and text outline in shared Google doc		1,5 hrs
15.00 – 15.30	Coffee Break		30 min
15.30 – 17.00	PLENARY review of key points and text outline via short presentations from break out groups. Mix people among groups for detailed feedback on the written key points.		90 min
17.00 - 17.15	Wrap up of the day	Louise/Jacob	15 min
17.15 - 18.00	MARINE BOUNDARY LAYERS WITH SUBMESOSCALE SURFACE HETEROGENEITY: LES RESULTS	Peter Sullivan	45 min

18.00 **Bus departure to boat**
18.30 – 21.30 **Tour on boat through Kager Lakes**
 with oriental buffet
21.30 **Bus departure to Lorentz Center,**
 Central Station, and hotel

THURSDAY	Activity	Speaker/moderator	Duration
9.00 – 9.15	Day opening and objectives	Louise/Jacob	15 min
9.15 - 10.15	PLENARY: Discuss opportunities, initiatives strategies (ways forward), International Working Group on Air-Sea Interaction		60 min
10.15 – 10.45	Coffee Break		30 min
10.45 – 12.00	WRITING SESSION: in small groups, individual, write text and make figures		75 min
12.00 - 13.30	Lunch Break, walk over to canteen		1,5 hrs
13.30 - 15.00	WRITING SESSION: in small groups, individual, write text and make figures		1,5 hrs
15.00 – 15.30	Coffee Break		30 min
15.30 – 16.45	WRITING SESSION: in small groups, individual, write text and make figures		75 min
16.45 - 17.00	Wrap up of the day	Louise/Jacob	15 min
17.00 - 18.30	Pizza & Drinks		
18.30 - 19.00	Walk over to Naturalis Biodiversity Center		

19.00 - PUBLIC LECTURE at Naturalis: The ocean's role in mitigating climate change
20.00 Ivy Frenger

FRIDAY	Activity	Speaker/moderator	Duration
9.00 – 9.15	Day opening and objectives	Louise/Jacob	15 min
9.15 - 11.00	WRITING/FEEDBACK: reading assigned sections and providing feedback/edits		1.5 - 2 hrs
10.30 – 11.00	Coffee Break		30 min
11.00 – 11.45	KEYNOTE: Atmospheric Influence on the Gulf Stream in Summer:	Shoshiro Minobe	45 min
11.45- 12.00	Next steps and Adjourn	Louise/Jacob	15 min
12.00 - 13.30	Lunch Break, walk over to canteen		1.5 hrs
13.30 -	Departure		