Summer School on
"Prediction Across Timescales: Predictability Assessment and Communication of Uncertainty for Applications in Environment and Society"

Date: 23-27 February, 2026

Location: Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Buenos Aires, Argentina.

Background

Forecasts on sub-seasonal to inter-decadal timescales have a diverse range of applications in climate services, including disaster preparedness, and short- mid- and long-term planning. However, the complexity of methods, uncertainty assessment and ways to merge forecasts across timescales presents a significant knowledge and skill gap.

The Summer School on Climate Prediction Across Timescales aims to address these gaps, and it is designed for early-career researchers and advanced students interested in the science and application of climate predictions. The school will offer foundational and advanced lectures in the mornings and interactive, hands-on lab sessions in the afternoons.

The target audience of the school is: Graduate students and postdocs in atmospheric, climate, and data sciences; and junior researchers and professionals working in climate services or operational prediction. Participants are expected to have a basic background in climate science, statistics, or a related field; basic programming skills are expected, proficiency in Python is encouraged but not required.

Objectives and outcomes

- Foster understanding of key concepts including predictability, forecast skill, sources of predictability, and cross-timescale interactions
- Provide an overview of novel tools to determine the predictability and assess forecast skill.
- Introduce emerging tools in machine learning and AI for forecasting.
- Develop practical skills through interactive lab sessions focused on real data

Participants will:

- Gain new theoretical and technical skills
- Engage in group discussions and applied exercises with real (i.e. not synthetic) data.

Tentative Programme

Monday 23 February

Welcome and introduction	
9:00-9:10	Welcome
9:10-10:30	*- Introduction to Prediction Across Timescales: what, why and how?* *- Seamless predictions and modelling: state of the art* *- Introduction to S2S prediction* *- Introduction to interannual to decadal prediction*
10:30-11:00	Coffee Break
Preprocessing forecasts	
11:00-12:30	*- Systematic errors, errors correction* *- Model calibration*
12:30-14:00	Lunch
14:00-15:30	Hands-on session *The first hands-on session introduces participants to key datasets and tools, providing a practical complement to the morning's theoretical foundations.*
15:30-16:00	Coffee Break
16:00-18:00	*Poster & connect session. Participants are invited to bring a poster on their research and they will receive feedback from WGSIP members and peers*
Tuesday 24 February	
Understanding and measuring predictability	
9:00-10:30	*- Sources of predictability across timescales* *- Identifying Sources of Predictability via Causality and Information Theory*
10:30-11:00	Coffee Break
Predictions across timescales	
11:00-12:30	*- Cross-timescale Interference: Theory, Mechanisms, and Implications* *- Bridges of Opportunity to Merge Predictions Across Timescales*
12:30-14:00	Lunch
14:00-15:30	Hands-on session *Applied exercises related to predictability diagnostics and strategies for merging forecast information from multiple timescales.*
15:30-16:00	Coffee Break
16:00-17:00	Hands-on session

Wednesday 25 February	
Novel methods in climate forecasting	
9:00-10:30	*- The ML/AI Renaissance: Data-Driven Models for Forecasting* *- Explainable AI and Forecasts of Opportunity*
10:30-11:00	Coffee Break
Forecast evaluation	
11:00-12:30	*- Verification of forecasts* *- Probabilistic predictability assessment*
12:30-14:00	Lunch
14:00-15:30	Hands-on session *Practical implementation of ML algorithms, verification tools and probabilistic assessment using real-world forecast data.*
15:30-16:00	Coffee Break
16:00-17:00	Hands-on session
Thursday 26 February	
Climate prediction in practice	
9:00-10:30	*- Coordination for Climate Prediction* *- Co-production of Climate Information*
10:30-11:00	Coffee Break
11:00-12:30	*- Science communication for climate prediction*
12:30-14:00	Lunch
14:00-15:30	Hands-on session *Participants engage in exercises focused on designing communication strategies and co-developing forecast products with end users.*
15:30-16:00	Coffee Break
16:00-17:00	Hands-on session
Friday 27 February	

9:00-10:30	Participant's presentations
10:30-11:00	Coffee Break
11:00-12:30	*Participant's presentations* *Closing remarks*
12:30-14:00	Lunch