

SEMINARIO DEL GIOVEDÌ  
CETEMPS

**Tropical-extratropical interactions in  
ensemble predictions from sub-seasonal to  
decadal scales**

***Dr. Franco Molteni***  
*ECMWF, Reading, UK*

**Martedì 19 Settembre 2017**  
**h. 11:00, Aula A0.3 Edificio A. Turing**

**Abstract:** Since the late 1980's, experimental and operational ensemble forecasts on the seasonal scale have relied on the detection of predictable signals originated by ocean-atmosphere interactions in the tropical regions (particularly from ENSO variability). Traditionally, when looking at seasonal means, the propagation time of circulation anomalies from the tropics to the extra-tropics is neglected. In the last decade, however, the relevance of tropical-extratropical interactions for sub-seasonal forecasts (typically from 2 to 8 weeks ahead) has been widely recognized, and on this time scale the time lag between tropical and extra-tropical anomalies cannot be neglected. Therefore, ensemble perturbations originated in the tropics will influence the mid-latitude ensemble dispersion after a time of the order of one to two weeks. The first part of this lecture will review observational and modelling evidence on the lagged relationships between tropical and extra-tropical anomalies in the context of sub-seasonal ensemble predictions. In the second part, the lecture will focus on scales longer than seasonal, and examine tropical-extratropical interactions on decadal scales. The role of ocean-atmosphere interactions in both the tropics and northern extra-tropics in modulating regional warming trends will be reviewed, and it will be shown how large ensembles of simulations may be used to explore dynamical hypotheses about the origin of warming amplification or slowdown in specific regions and seasons.

**Biografia:** Franco Molteni is a Principal Scientist in the Earth System Predictability section of ECMWF, lead officer for climate projections in the Copernicus Climate Change Service (C3S), and former Head of the ECMWF Ensemble Prediction and Seasonal Forecast sections. He contributed to the development of several aspects of ensemble predictions, including the generation of initial perturbations with singular vectors, and has a leading role in predictability research on the sub-seasonal and seasonal scale focused on atmospheric flow regimes and tropical-extratropical teleconnections.