

2024_58_Physics_RT: A New Global Tropical Cyclone Model

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Tropical cyclones are one of the most dangerous natural hazards now and more so in the future. Much about their fascinating genesis and evolution remains insufficiently understood (1). It is proving challenging to model this phenomenon because of the wide range of scale in time and space as well as the vast range of physical processes involved. Everything we know about atmospheric physics affects tropical cyclones. Synthetic or stochastic models are extremely powerful tools for risk assessment (2). In this project you will join the tropical cyclone research group to build a new global stochastic model of tropical cyclones called IRIS (Imperial College Storm Model). We want this model to be Physics informed, not just statistical. The aim is for IRIS to make seasonal predictions and simulate the impact of climate change. For this we need to understand the role of the Pacific El Nino oscillation to enable seasonal forecasts globally. A version of IRIS is now also run on smartphones by the general public to create the largest open and free database of global tropical cyclone risk(3). You will join the largest research group in Europe working on tropical cyclones.

1. <https://www.annualreviews.org/doi/abs/10.1146/annurev.earth.31.100901.141259>
2. <https://www.nature.com/articles/s41597-020-0381-2>
3. <https://www.imperial.ac.uk/grantham/research/climate-science/modelling-tropical-cyclones/>

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