

**Asia-Pacific Typhoon Collaborative Research Center  
International Tropical Cyclone Collaborative Research Guide (2024)**

**I. Synopsis**

The Asia-Pacific Typhoon Collaborative Research Center (AP-TCRC) is a newly-established international joint typhoon research unit located in the Lingang Special Area of Shanghai, China. It is supported by the ESCAP/WMO Typhoon Committee (the Committee) and hosted by the Shanghai Municipal Government of China and the China Meteorological Administration.

The International Tropical Cyclone Collaborative Research Guide provides information on both long-term (1 year, could be extended) and short-term (2-3 months) research areas on tropical cyclones (TCs) to be supported by AP-TCRC (<https://ap-terc.org>). These include TC observations, modeling and prediction, marine meteorology and related new technologies.

**II. Research Areas**

**a) International tropical cyclone scientific experiment and data analysis in the Asia-Pacific Region**

- R&D of new instruments (in situ or remote sensing, automatic or autonomous) and assessment of their applicability in observing TC multi-scale structures, cloud microphysical characteristics, and air-sea interaction processes
- Analyses of data collected through the field experiments to study physical characteristics associated with TCs

**b) Tropical cyclone modeling**

- Development of a fully-coupled air-sea-wave model to study the physical processes related to TC motion and structure (intensity and size) and to improve the forecasts of these elements
- Evaluation and/or development of parameterization schemes for key physical and chemical processes to improve TC forecasting
- Development of multi-source TC data assimilation technologies to improve TC forecasting

**c) Application research**

- Research on establishing TC-related standards, and compiling data in producing TC climatological atlas products.
- Research on (i) the impact of global warming on the trends of TC activities, (ii) the changing characteristics of catastrophe risks related to TCs, and (iii) response strategies under future climate change.
- Research on TC-induced storm surge models and response strategies, and establishment of a disaster risk and vulnerability evaluation framework related to TCs
- Development of a TC impact-based model, and enhancement of TC catastrophe risk assessment technologies

### **III. Priority Funding Missions for 2024**

#### **1. International tropical cyclone scientific experiment and data analysis**

- 1.1 R&D on new instruments suitable for observing TC conditions and applicability assessment
- 1.2 Research on the fine structure, precipitation and wind effects associated with TCs in megacities
- 1.3 Research on the techniques of TC forecasting and climate prediction, including the use of big data
- 1.4 Development of Asia-Pacific typhoon data standards, collection and compilation technology, and TC climatological atlas product development

#### **2. Tropical Cyclone modeling**

- 2.1. TC air-sea coupled model development
- 2.2. Parameterization schemes of physical processes adapted to TC conditions
- 2.3. Forecast verification methods for the TC model
- 2.4. TC data assimilation technology

#### **3. Disaster mitigation**

- 3.1. TC-induced inundation model development
- 3.2. TC anomalous characteristics and associated mechanisms under climate change
- 3.3. Seasonal and sub-seasonal TC forecast techniques
- 3.4. Use of Artificial Intelligence in TC monitoring and forecasting
- 3.5. Forecast techniques of TC in an urban environment

### **IV. Application Method**

- If you are interested in working in the AP-TCRC to carry out the funding research, please refer to the “Priority Funding Missions for 2024” in the Guide, and send your Curriculum Vitae, Application Form (Attachment 2), and the Consent to Collection and Use of Personal Information (Attachment 3) to the email address: [ap-tcrc@typhoon.org.cn](mailto:ap-tcrc@typhoon.org.cn) before 20 March 2024. The results will be released on April 15, 2024.
- Project funds will be estimated according to the visit time and workload, which will include a return economy class ticket, an allowance 10,000 to 50,000 RMB per month, dormitory and scientific research support.