



## Student Scholarship Internship Opportunity (SSIO) Online System

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### SSIO 2022 Internship Opportunity Position

#### Internship Information

**Project title:** Moisture variability in extreme precipitation events in northeast Colorado as simulated by the GFDL SHIELD model (for CSC Student)

**NOAA mission goal:** Weather-Ready Nation

**Hypothesis or objectives:** This application is for 1 graduate student to work 3 months from May 23 rd to August 12 th 2022 at OAR/GFDL.

This project will analyze the role of moisture variability in summertime heavy precipitation events in northeast Colorado using the GFDL System for High-resolution prediction on Earth-to-Local Domains (SHIELD) model. The analysis will be on the vertical distribution and diurnal variability of moisture and their interactions with the available dynamic forcing and thermodynamic instability within a range of spatial scales, from the convective- to synoptic-scale.

Two goals to be achieved: 1) to simplify the complexity of multi-scale interactions by identifying key ingredients and processes that are common to the observed heavy precipitation events. 2) to assess the representation of the simulated fields in the SHIELD model by comparing them to radar, lidar, and radiosonde observations taken during the recent NSF Preparatory Rockies Experiment for the Campaign in the Pacific ("PRE"-CIP). These comparisons will be vital for improving the SHIELD model performance across a variety of weather phenomena.

**Academic status:** Graduate

**Estimated start - end date:** May 2022 - August 2022

**Duration:** 3 months

**Area(s) of discipline:** Atmospheric Science

**Internship location:** Princeton, NJ

**Duties and responsibilities:** Access and download SHIELD model outputs from the GFDL archive. Visualize the model outputs including the precipitation, moisture, wind, and temperature fields and compare them with the observations. Summarize the analysis results to achieve the scientific goals.

**Special skills/training required:** Software for manipulating and visualizing model output and observation data, specifically Python and MATLAB.

**Expected outcomes:** The intern student is expected to get familiar with handling the model data on the high-performance computing systems during the project. The student will learn the moisture and precipitation process in the model from the GFDL experts, as well as the basic concept of model development during the interaction with GFDL scientists. A formal oral presentation to the entire GFDL community before the end of internship. An oral or poster presentation in AMS or

AGU annual meeting, and a peer reviewed journal paper if appropriate.

**Guidance and supervision:** Intern will be supervised by: Mingjing Tong (mentor) and Jan-Huey Chen (Co-mentor). Weekly meetings between the mentors and student will be held. Assistance with data and software will be provided by GFDL. Scientific discussion on results will be held with the mentors and rest of GFDL FV3 team members during the internship.

**Application package:** Resume

**Posted or modified date/time:** Monday, February 7, 2022 - 12:35:00 PM

### Internship Travel Information

**Purpose (student's role):** ---

**Mode of transportation:** ---

**Date(s):** ---

**Destination:** ---

**Estimated cost:** ---

**Source of funding:** ---

### Mentors Contact Information

**Name:** Mingjing Tong

**Organization:** Office of Oceanic and Atmospheric Research (OAR)

**Program office:** GFDL

**Mailing address:** 201 Forrestal Road  
Princeton, NJ 08540

**Fax number:** None

**Phone number:** 609-452-5340

**Email:** mingjing.tong@noaa.gov

**Co-Mentor name:** Jan-Huey Chen

**Co-Mentor email:** jan-huey.chen@noaa.gov

**Agency or organization:** NOAA/GFDL



### Admin Approval Information

**Comments:** Accepted for a minimum 3-month EPP/MSI NERTO internship. Requires: a workplan developed by CSC and NOAA mentor; substantial engagement with NOAA mentor(s); and, NOAA-aligned professional development. Queries are sent to: oed.epp10@noaa.gov. Thanks.

**Initials:** AT

**Approval date/time:** 2/8/2022 11:14:25 AM

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