



**NOA1769-Support Scientist-
Hurricane Weather Research-HMON
Modeling
College Park, MD**

I.M. Systems Group, Inc. (IMSG) is seeking a candidate to support the Environmental Modeling Center (EMC) of the National Centers for Environmental Prediction (NCEP) in carrying out research and development work related to the operational hurricane forecast systems. The candidate's work will involve the development, execution, testing and evaluation of several different components of the HWRF (Hurricane Weather and Research Forecast) and HMON (Hurricanes in a Multi-scale Ocean-coupled Non-hydrostatic) modeling system that include data assimilation, physics, dynamics, and vortex initialization, coupling to ocean, wave, land, storm surge and inundation models.

Duties: The candidate will perform the functions of the job in a high-quality, independent and collaborative way, assisting in managing projects, and developing and applying innovative methods for the primary work areas below.

The candidate will work with EMC scientists and external collaborators to set up comprehensive tests of the Hurricane models and performs evaluations of the results using objective verification metrics and model diagnostics. The candidate will work on several tasks including transitioning HWRF and HMON capabilities into more advanced ESMF based infrastructure and multi-scale modeling framework (e.g., NMM-B), improving hurricane data assimilation, dynamics and high-resolution telescoping nesting techniques, implementing advanced hurricane physical parameterization techniques applicable at 1-3 km resolutions and determining areas of improvement needed to increase forecast skill. This work will include:

- Developing advanced data assimilation and initialization methods for operational hurricane models HWRF and HMON
- Implementing existing moving nest algorithms into ESMF based NOAA Environmental Modeling System (NEMS) framework on different grid projections
- Developing/implementing generalized nesting techniques for global-to-local scale applications
- Developing new or improving existing physical parameterization schemes for multi-scale high-resolution hurricane models
- Developing advanced scripts for flexible end-to-end system integration and automation, and allow for additional functionalities
- Design, setup and execution of pre-implementation tests for periodic operational HWRF and HMON upgrades

Required Skills:

Education and Experience:

- Ph.D. in atmospheric sciences or meteorology, oceanic, mathematics or a related physical science; with at least 5 years of experience in the area of hurricane/tropical cyclone modeling

Knowledge, Skills and Abilities:

- Advanced knowledge of data assimilation methods applicable to tropical storms
- Advanced knowledge of tropical meteorology, in particular tropical cyclones
- Knowledge of the physical and mathematical basis of geophysical modeling (atmospheric and/or oceanic) and experience running a Numerical Weather Prediction model.
- Demonstrated skill in communicating effectively with scientists of diverse backgrounds on technical details of the work plan and to present results accurately and clearly in both oral and written form
- Ability to work independently and in the team environment
- Initiative to work on complex problems and solve problems creatively.
- Experience in high-resolution model development in various infrastructures like WRF and ESMF
- Experience in advanced scripting languages (e.g., UNIX, PERL, ksh, PyThon, Ruby etc.)
- Experience in model testing and evaluation and/or knowledge of verification principles.
- Demonstrated skill in performing tasks requiring organization and attention to detail.
- Extensive practical application of computing languages such as Fortran and C, geophysical data formats (NetCDF, GRIB etc.), and graphical display programs such as GRADS, GEMPAK, MATLAB, IDL etc.

Desired Skills:

- Demonstrated experience with the WRF model and ESMF infrastructure.
- Familiarity with the POM and/or HYCOM ocean models, or their equivalents.
- Experience with high-performance computing.
- Familiarity with operational Numerical Weather Prediction and forecasting environment.
- Familiarity with vortex scale observations from aircraft/satellite measurements and methods to compare model output to these observations

Please note U.S. citizenship or green card is required for the position.

To Apply:

Please apply directly to our career portal or website: www.msg.com or <https://careers-icims.com> **(NOA1769 Support Scientist-Hurricane Weather Research-HMON Modeling)**

Include your resume, three references with contact information and a cover letter explaining how your qualifications meet the requirements of the position.

Please indicate your timeline of availability and preferred salary level for consideration.

MSG offers an outstanding overall Benefits Package including company paid leave, medical dental, vision, and 401K. MSG is an Equal Opportunity Employer and Veteran Friendly.

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