

Post-doctoral fellowship opportunity on detection, monitoring, and prediction of pyroconvection

Naval Research Laboratory (NRL) Marine Meteorology Division (MMD), Monterey, CA

The NRL Marine Meteorology Division (NRL MMD) is seeking a post-doc to join an exciting new study investigating the detection, monitoring, and prediction of wildfires that generate pyrocumulonimbus (pyroCb) and precursor pyrocumulus (pyroCu). This project, led by Dr. David Peterson, aims to improve the decision-making process for all pyroconvective hazards affecting firefighter safety and advance smoke transport forecasting for a diverse set of domestic and international stakeholders and partner organizations worldwide. The candidate will focus on developing improved pyroCb/pyroCu detection algorithms and prediction applications using sensors on polar-orbiting and geostationary satellites, as well as airborne science platforms. The successful candidate will work directly with a team of NRL scientists with expertise in satellite data processing and automation, in-situ and remote sensing measurements, aerosol modeling, wildfire science, numerical weather prediction, and also collaborate with leading scientists outside NRL. The candidate will test and demonstrate the products developed in this project during the [INjected Smoke and PYrocumulonimbus Experiment \(INSPYRE\)](#), with field deployments planned in western North America during 2026 and 2027.

Candidates are required to be US citizens, and should have a doctorate degree focusing on atmospheric sciences, meteorology, earth sciences, geosciences, or a related field. Detailed knowledge of multispectral and multiangle remote sensing techniques and retrieval algorithms is required. Scientific background in one or more of these areas is highly desirable: machine learning, radiative transfer, convection, fire weather, aerosol transport, and/or general meteorology. Experience with Python, data analysis, statistics, numerical modeling, and high-performance computing is also desired. The candidate is expected to publish results of investigations and applications of their research in professional journals and present these results at scientific meetings.

The position is open starting 01 November 2024 at the NRL MMD in Monterey, California, USA. NRL has access to excellent High-Performance Computing resources. Postdoctoral fellowships provide a highly competitive stipend, relocation, and travel support. Our postdoctoral fellowships are offered for a period of one year and are renewable for up to an additional two years. They are administered by either the National Research Council (<https://www.nrl.navy.mil/Careers/Post-Docs/NRC/>) or the American Association for Engineering Education (<https://www.nrl.navy.mil/Careers/Post-Docs/ASEE/>). Applications through ASEE are accepted at any time. The NRC deadlines are quarterly, with the next deadline on 01 February 2025. Postdoctoral fellowships are offered based on an internal and external review of the applicant's research proposal and on the strength of graduate school transcripts and recommendations. To develop a successful research proposal, applicants are strongly encouraged to work closely with Dr. David Peterson (david.a.peterson204.civ@us.navy.mil).

NRL MMD strives to develop and maintain a diverse workforce. NRL MMD is committed to providing equal opportunity for all employees and applicants for employment and does not discriminate on the basis of race, ethnicity, gender identity and expression, sexual orientation, socio-economic status, age, physical abilities, neurodiversity, physical appearance, veteran status, religious beliefs, political beliefs, country of origin, working style, job category, education level, cultural background, and marital and parental status. We are committed to inclusivity and promoting an equitable environment that values and respects the unique intersection of identities of the members in our organization. You are welcome in our lab.

References:

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- Peterson, D. A., and Coauthors, 2021: [Australia's Black Summer pyrocumulonimbus super outbreak reveals potential for increasingly extreme stratospheric smoke events](#). npj Climate and Atmospheric Science, 4, 38.
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- McHardy, T. M., D. A. Peterson, J. M. Apke, S. D. Miller, J. R. Campbell, and E. J. Hyer, 2024: [Novel Comparison of Pyrocumulonimbus Updrafts to Volcanic Eruptions and Supercell Thunderstorms Using Optical Flow Techniques](#). Journal of Geophysical Research: Atmospheres, 129, e2023JD039418.