

The Advanced MRI Section (AMRI) in the Intramural Research Program of the National Institute of Neurological Disorders and Stroke at the National Institutes of Health (NIH) in Bethesda, Maryland has two postdoctoral fellow openings: one for the development of high-resolution, high-field MRI methods to study iron and myelin distributions in the brain in health and pathology, and one for its all-night EEG-fMRI sleep study. Candidates interested in other projects will also be considered.

AMRI continues to be active in the development of novel MRI methods for study of the brain. Recent hardware and pulse sequence developments in AMRI have improved resolution, robustness to head motion, and sensitivity to the unique effects of iron and myelin on image contrast. Sophisticated methods are being developed to combine various MRI contrasts to improve the separation between iron and myelin. In part, this is based on detailed analysis of T_2* and T_2 signal decays in the various brain tissue types. AMRI maintains active collaborations with other research groups that have interest in applying novel methods to the study of neurodegenerative disorders and epilepsy.

In addition to developing unique methods for white matter imaging, ultra-low and ultra-high field imaging, and perfusion imaging, the Section is interested in studying the brain with fMRI during sleep. This encompasses the characterization of both neuronal and autonomic activity changes across the full range of arousal states during overnight sleep. After a successful pilot study, AMRI is approaching completion of a main study, in which 43 subjects underwent two 8-hour nights of EEG-fMRI. Early analysis of the pilot data has revealed novel interactions between autonomic and neural activity that will be further investigated with advanced analysis techniques. It is anticipated that further development of analysis approaches will be important for proper analysis and interpretation of the data.

As part of the NIH intramural program, AMRI has access to unique imaging and computational resources, including access to four 3 T and three 7 T human MRI scanners, EEG and MEG systems, and a large (currently 107,000-core) computational cluster. A human 11.7 T is slated to be (re)energized over the next few months. In addition, AMRI has expertise in state-of-the-art MR imaging techniques and data analysis tools, and a dedicated group of researchers including MRI physicists and a sleep neuroscientist.

Minimum qualifications:

- A relevant doctoral degree by the time the appointment begins
- Strong quantitative data analysis skills in advanced statistics, signal processing, and scientific computer programming
- Interest in developing novel MRI research avenues and/or methods

The start date is summer/fall 2024. Applicants are requested to send their curriculum vitae to Jeff Duyn, PhD (jeff.duyn@nih.gov). The applicant is encouraged to include contact information for three references from mentors and/or colleagues.

For more information on the laboratory, see: https://amri.ninds.nih.gov
For more information on the NIH Postdoctoral Intramural Research Training Award Program, see: https://www.training.nih.gov/programs/postdoc_irp

The NIH is dedicated to building a diverse community in its training and employment programs.