The Cornell Magnetic Resonance Imaging Facility (CMRIF) is a state-of-the-art facility dedicated to scientific research and is equipped with a GE Discovery MR750 3T scanner. It is a university-wide resource located on ground floor of Martha Van Rensselaer Hall in Ithaca campus. It provides noninvasive imaging with high signal-to-noise ratio and spatial resolution for anatomic and functional investigations of a wide range of specimens including humans, animals, plants and biomedical materials. MRI offers rich tissue contrasts without using ionizing radiation, making it ideally suited for various scientific studies including neuroscience, behavior science, biomedical sciences, radiology, and plant physiology, and basic physics and engineering.

**MRI Scanner**

GE Discovery MR750 3T MRI scanner

- Bore size: 60 cm
- Maximum Field-of-View: 48 x 48 x 48 cm³
- High performance whole-body gradient
- Peak Gradient Amplitude: 50 mT/m
- Slew Rate: 200 mT/m/s
- Independent Receiver Channel: 32

**RF Coils**

- 32-channel head coil
- 32-channel cardiac array coil
- 32-channel torso array coil
- 16-channel head-neck-spine array coil

**Pulse Sequences**

Multi-echo EPI

Acquiring several echo times simultaneously enables reduction of a broad range of artifacts on the basis of T2* relaxometry and multivariate decomposition for improved functional specificity.

**Real-time AFNI Display**

- Functional time courses displayed in real time
- Time-synchronized physiological recordings via scanner’s built-in photoplethysmograph and pneumatic respiratory belt
- Cardiac waveforms
- Respiratory waveforms

**Current Principal Investigators**

<table>
<thead>
<tr>
<th>College of Agriculture and Life Sciences</th>
<th>College of Human Ecology</th>
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<tr>
<td>Ashim Datta</td>
<td>Adam Anderson</td>
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<td>John Hale</td>
<td>Eve De Rosa</td>
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<td>Khena Swallow</td>
<td>Wenning Luh</td>
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<td>Sam Tisé</td>
<td>Nathan Spreng</td>
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<td>Christopher Hernandez</td>
<td>Valerie Reyna</td>
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<td>William Olbricht</td>
<td>Sofia Cerda-Gonzalez</td>
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**How to Start a New Study**

- Consult with the Technical Director
- Submit CMRIF research proposal
- Complete required training:
  - CMRIF Safety Training course conducted by the Environmental Health & Safety (EH&S) and the CMRIF staff (a refresher course required every year afterwards)
  - Universal Precautions course conducted by EH&S (one-time requirement)
- Heartsaver CPR/AED certificate
- Obtain IRB/IACUC approval if applicable
- Schedule scanner time
- User fees:
  - Staff:
    - Cornell: $236
    - External Federal: $366
    - External Non-Federal: $509
  - Animal/Plant/Inter: $236
  - $1,500

**Functional MRI Peripheral Devices**

- MR-safe 32-in LCD monitor
- High-fidelity headphones
- Galvanic skin response recording
- High-speed eye tracking system
- Fiber-optics subject response devices and interface
- Scanner-triggered stimulus software
- E-Prime
- Presentation
- PsychoPy
- MATLAB
- Pain delivery unit

**Collaboratively-developed Devices**

MRI-compatible odor, taste, and pain delivery machines

- Olfactometer
- Gustometer

**Animal Anesthesia**

- MR-compatible anesthesia machine
- MR-compatible physiological monitor device

**First Publication from CMRIF**

**Goal-Congruent Default Network Activity Facilitates Cognitive Control**

- R. Nathan Spreng, - Elisabeth DePauw, - Themis Melissaris, - Julian Garcia, - Sofia Galván, - Judith Makelar, - Wenning Luh, and Gary R. Tuteur
- Center for Brain and Cognitive Development, Center for Neuroimaging Sciences, and Center for Magnetic Resonance, Cornell University, New York City, USA. Supported by the National Institute of Health (NIH) Training Grant T32 NS071245 to C.R.R.

**Cornell Brain Bank**

T1 Resting fMRI T2 Perfusion QSM

Group T-maps of subcortical connectivity

**Overview**

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- **Collaboratively-developed Devices**
- **Animal Anesthesia**
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**Cornell MRI Facility**

https://mri.cornell.edu/