

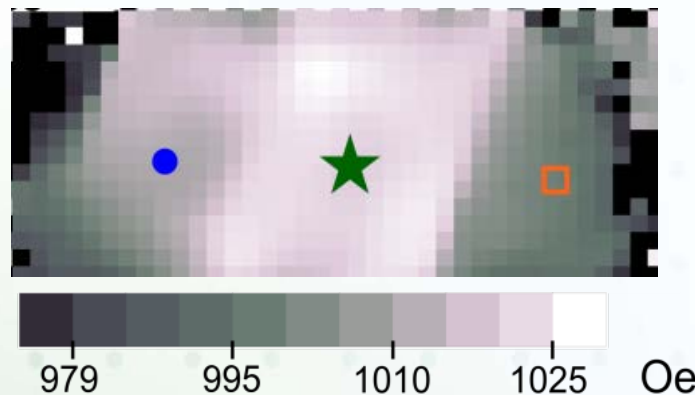
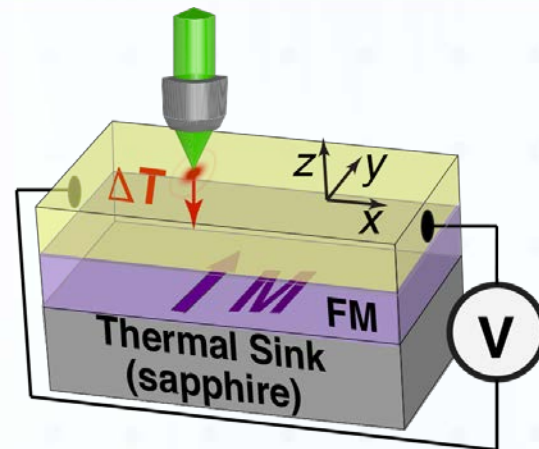
# New Microscope Watches Magnets Move at High Speed

Cornell Center for Materials Research: A NSF MRSEC

Hard disks and next-generation computer memories store data in tiny magnets that point in one of two directions, perhaps “up” or “down.” Writing information requires each magnet to be “flipped” into the correct orientation. One limitation for high-speed writing is that magnets do not flip instantaneously or uniformly. They often flip in patches that grow with time.

Scientists at Cornell University have invented a new type of microscope that uses ultrafast pulses of heat from a laser to image the high-speed magnetic motion in a promising class of magnets that do not conduct electricity. For example, the color in the image at right represents a spatial map of the magnetic field where the motion is the largest in one of these new magnets.

Using this new microscope, scientists will be able to develop new magnetic materials for faster magnetic memory that consumes less power.



(Top) The new magnet microscope and (bottom) an image of the resonance magnetic field in non-conducting Yttrium Iron Garnet (YIG) magnet.