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The National High Magnetic Field Laboratory and its Industrial Interactions¹

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The National High Magnetic Field Laboratory is an NSF funded multi-disciplinary, multi-user facility for research using high magnetic fields. The MagLab is the largest laboratory of its kind in the world, holding world records for its magnets across a broad range of categories. These unique magnets, which are designed and built in-house, range from a 100T non-destructive short pulse magnet, a 45 T DC hybrid magnet, 35 T DC resistive magnets, to a 900 MHz (21.5T) ultra-wide bore magnet for MRI research. Over 1400 users per year use the facility at its three sites in Tallahassee FL, Gainesville FL and Los Alamos NM. The MagLab's unique magnets and measurement capabilities enable a wide variety of interactions with industrial partners. These range from efforts to develop new high strength materials, create high field permanent magnets that use less rare earth elements, and interactions to improve, develop and test new high temperature superconducting wires and cables. In addition, measurement capabilities are used to analyze complex mixtures such as crude oil, pharmaceuticals, and natural products. These capabilities have led to partnerships with petroleum companies seeking solutions to problems ranging from pipeline clogs to refining high sulfur oils efficiently. These capabilities have also enabled research efforts with aircraft manufactures that solved fuel system problems as well as research to create more sustainable fuels. In addition, unique NMR / MRI capabilities have led to innovative research on batteries and improved materials for catalysis and fuel cells.

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