MAGNETIC PERSONALITY

THE NEWEST ADDITION TO THE UNIVERSITY OF MINNESOTA’S BIOMEDICAL DISCOVERY DISTRICT IS DESIGNED TO HOUSE AND ADVANCE LEADING-EDGE MAGNETIC RESONANCE TECHNOLOGY

BY JANE KING HESSION
The glass-walled public areas of the University of Minnesota’s newly expanded Center for Magnetic Resonance Research (CMRR), designed by RSP Architects, offer impressive panoramas of the East Bank campus, including TCF Bank Stadium. But deep within CMRR’s enclosed research spaces, the magnet-generated, high-resolution views of human brain activity and body systems are nothing short of astonishing.

CMRR, an interdepartmental, interdisciplinary research facility established in 1991, currently houses eight state-of-the-art high-field magnets that are capable of producing detailed, non-invasive studies known as magnetic resonance images (MRIs) of living subjects, primarily for research purposes. MRIs have the potential to map the human brain and advance the study of myriad medical conditions, from diabetes to cancer, from psychiatric disorders to obesity.

As sophisticated as the technology has become, some argue that the field is still in its infancy. “The exquisite anatomical information provided by MRI has only been a prelude, as the boundaries of this imaging have been relentlessly expanded,” says CMRR director Kamil Ugurbil, Ph.D.

Because of the exponential advancement of magnetic resonance technology and the development of increasingly powerful magnets, CMRR outgrew the RSP-designed building it had inhabited since 1999. During that same time, CMRR’s services had become invaluable to many university departments and disciplines, including neurosurgery, cardiology, tumor biology, and stem-cell research. More space was needed for additional magnet rooms, new clinical suites, and support services, as well as to enhance interface for university-wide access to CMRR technologies.
The design expresses CMRR’s international stature as a research center but also evokes the building’s collegial and physical relationship to neighboring facilities in the U’s Biomedical Discovery District.
In its design for the 102,400-square-foot expansion and renovation, which opened last fall, the RSP team sought to express CMRR’s international stature as a research center but also evoke the building’s collegial and physical relationship to neighboring facilities in the U’s Biomedical Discovery District. “The brick, precast concrete, and curtain wall vocabulary of the exterior of the building is a cohesive district standard,” says RSP senior associate Judd Brasch, AIA.

The physics of CMRR’s core services—high-field magnets—presented restrictive site and design challenges for the RSP team. The asymmetrical geometry of the building’s two-wing plan was generated by the varying sizes and strengths of the magnets, measured in Tesla units, and their respective magnetic fields. “By responding to the performance criteria of the magnets, the building design was able to provide an infusion of natural light in research support spaces that are often windowless,” explains project lead designer Ted Davis, AIA.

For optimal performance, CMRR’s magnets, some of the most powerful in the world, had to be properly shielded from outside interference, and magnetic fields couldn’t overlap. Furthermore, people, computers, and other electronic equipment needed protection from strong magnetic forces. The fact that only nonferrous materials—those not subject to magnetic attraction, such as concrete, wood, fiberglass, and aluminum—could be used in the magnet suites’ structural, mechanical, and electrical systems and finish materials presented another challenge. “Our goal was to provide a safe and ideal working environment for researchers, one in which pens, clips, and other ferrous objects would not become airborne projectiles,” says Brasch.

“The sense of progression as you move through the building, including the connection between inside and outside, relates to the sequencing of slices of MRI imagery used in research,” says Davis. Indeed, those entering the building move from the light-filled glass-walled lobby, whose openness >> continued on page 51
Color Therapy
<< continued from page 25

Employees, meanwhile, benefit from abundant natural light and private spaces that allow them to disconnect and take a break or have a conversation. At Amplatz, these private areas are referred to as “offstage,” a concept borrowed, fittingly, from Disney World. Of course, patients and their families get dedicated spaces, too. So far, 23 of the 96 patient rooms have been made more home-like and fun through an Adopt-a-Room campaign. (Someday, with donor help, all of the rooms will be upgraded.)

“Think about an average hospital room,” says Williams. “If you can’t get out of bed, you’re absolutely reliant on someone else. And kids don’t like that. Adults don’t like that. So in the rooms that have been ‘adopted,’ the child can change the lights, raise and lower the shades, and access the TV, the Internet, movies, video games, and teleconferencing, all from his or her bed.”

Anecdotally, staff and patients report not just a psychological benefit from the new facility but also a physical one, and studies are under way to prove that, through good architecture and collaboration, this beautiful, well-designed hospital delivers exceptional care. AMN

Magnetic Personality
<< continued from page 29

telegraphs CMRR’s status as an accessible university-wide resource, to successively more shielded and secure research areas along the building’s spines.

Likewise, several design elements, notably the rhythmic pattern of glazing in the lobby and public corridors, recall sliced MRI images. Curved surfaces, such as the red Venetian plaster wall of the second-floor seminar room, are reflective of a magnet’s magnetic field, or the space into which a subject is placed for study. Bold shots of color punctuate the floors and walls of the high-tech laboratory environment.

The service courtyard between the two wings brings daylight into several interior spaces and is also a repository for an eye-catching sculptural object: one of the first 4-Tesla human MRI magnets ever produced. Although no longer in use, it’s a powerful symbol of the rapid advancement of MR technology—and CMRR’s position at the forefront of new discoveries in the field. AMN

Introducing Reclaimed Douglas Fir Engineered Flooring

Solid, True Wood Surface
3/16” of 100% reclaimed Douglas Fir
Gorgeous old growth perfection
Singular past-life character

Stable, Healthful Base
7/16” of hardwood plywood
No formaldehyde added

Good to the Core
Made in Minnesota
Manufactured by FSC-certified company
25-year finish & lifetime structural warranty
Qualified LEED material/resource

DULUTH TIMBER COMPANY
LOGGING THE INDUSTRIAL FOREST
218/727-2145  www.duluthtimber.com
millwork / flooring / timbers / laminates resawn from salvaged redwood / cypress / heart pine / douglas fir

Lighting with care

Our January/February 2011 issue profiled CMRR’s neighbor, the Wallin Medical Biosciences Building.