

BENEFITS TO DSSC MEMBERS

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- Access to a pool of skilled graduate students and postdocs assigned to your projects, or as potential employees
- Interaction with faculty experts in several different disciplines as part of investigative teams on sponsored projects, or as consultants on your technical needs or problems
- Advance copies of all research findings and reports
- License to use DSSC patents and software
- Access to the DSSC's state-of-the-art clean room and magnetic measurement facilities, plus other university laboratories, facilities, and equipment
- Attendance at members-only workshops for technical exchange on data storage and magnetics
- Placement of your research scientist or engineer at the Center
- Membership on the DSSC advisory board, to share views with other member companies and help set the Center's future goals
- Publications on research, an annual report, technical reviews, and other key information



DELIVERING ON THE PROMISE....

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Accomplishments...

- More than 60 new and modified data storage related courses introduced into CMU curriculum, at both the undergraduate and graduate levels
- About ten M.S. and ten Ph.D.'s graduated per year
- Several start-up companies are a result of DSSC research outcomes and technology
- Approximately five or six invention disclosures, patents, and software licenses to DSSC members per year
- An average of 30-40 examples of technology transfer to industry per year
- An average of 25-30 short courses, seminars, and workshops led by DSSC faculty per year
- An average of 50-60 papers published per year, with about 20% of them being written in collaboration with people from industry or other universities
- DSSC key participant and leader in numerous INSIC projects
- A timeline of significant DSSC research accomplishments can be found at the DSSC website (www.dssc.ece.cmu.edu)

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The Data Storage Systems Center

Advancing the State-of-the-Art in Magnetic and Optical Recording

Carnegie Mellon **ENGINEERING**

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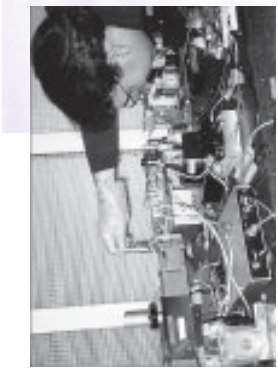
A National Science Foundation
Engineering Research Center from 1990-2001

ANTICIPATING FUTURE DEMANDS...

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Researchers predict that within a few years, personal computers will have processing speeds of more than a trillion instructions per second and RAM capacities of well into the gigabytes - all at costs comparable to PC prices today.

Data storage is the largest and fastest growing segment of the computer hardware industry. It is comparable to the semiconductor industry in revenue - with sales hitting \$100 billion.



But without technological breakthroughs, without well-trained scientists and engineers, without a sustained commitment to research efforts that industry alone cannot afford, data storage cannot keep up.

The Data Storage Systems Center (DSSC) at Carnegie Mellon University brings together the components needed for significant research breakthroughs:

- leading scientists and educators focused in the fields of magnetic disk and tape recording systems, optical recording systems, and advanced storage technologies
- state-of-the-art equipment and facilities
- industrial sponsors, ranging from new start-ups to Fortune 500 companies
- an interdisciplinary, systems-oriented approach to research

MEETING THE CHALLENGE...

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The largest university research center in data storage systems, the DSSC develops its target project goals with its industrial sponsors. Together, they tackle the vital long-term research needed to produce technological breakthroughs, as well as short-term needs required for commercial improvement.

Many industrial companies and government agencies sponsor research at the DSSC. In addition, the Center is a key contributor to the research programs of the Information Storage Industry Consortium.

Why is the DSSC one of the preeminent academic centers in data storage?

Integration...

Carnegie Mellon's culture stimulates the kind of interdisciplinary collaboration that can quickly propel a new idea from the chalkboard through research and into laboratory demonstration. Our scientists, researchers, and professors build teams to address all areas of a complex problem. Data storage systems demand solutions from electrical engineers, computer scientists, physicists, chemical engineers, material scientists, and mechanical engineers. DSSC experts unite their specialties to achieve their goals for revolutionary data storage solutions.

Expertise...

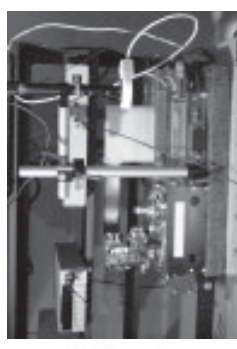
Carnegie Mellon has a history of accomplishments in magnetics technology research. Its Magnetism Technology Center, the forerunner of the DSSC, provided a substantial foundation of basic technology and expertise in magnetism, optics, and electrical engineering. Combined with the university's leadership in computer science and systems integration, the DSSC includes some of the world's best thinkers and innovators in data storage systems.

VITAL STATISTICS

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Equipment and Facilities...

- A 4,000 square-foot Clean Room (Class 100 and Class 10)
- 70,000 square feet of dedicated laboratories and office space for research into electronic, magnetic, optical, and other advanced materials (Roberts Engineering Hall, dedicated spring 1997)
- Four radio frequency shielded labs that allow for testing of advanced recording devices



- Magnetic disk and tape and optical test stand systems for testing state-of-the-art media, heads, and electronic subsystems

- Fabrication, measurement, and analytical facilities in the departments of Chemical Engineering, Electrical and Computer Engineering, Materials Science and Engineering, and Physics

Strategic Goals...

- Magnetic Disk Recording Density: 1 Tb/in² by 2005
- Magnetic Tape Recording: 6 Gbit/in² density, 20 m/s performance by 2007
- Optical Recording: Efficient read/write systems beyond the diffraction limit

The DSSC was founded in 1990 as one of a prestigious group of NSF engineering research centers in the country. It received an 11-year, \$28 million grant from the NSF.

The team: about 40 industrial participants, about 25 principal scientists and faculty, more than 70 researchers, staff, and students.