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Micromem Technologies Inc. Announces Results of Independent Study of its Magnetic Memory Technology

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(Toronto, Ontario: September 28, 2004) - Micromem Technologies Inc. ("Micromem"), a company engaged in the research and development of Magnetic Random Access Memory (MRAM), today announced that it retained Dr. Cynthia Kuper as an independent consultant to review its technology. The results of Dr. Kuper's findings have been set forth in her report entitled, "State of the Technology Report" which was received by Micromem today.

Highlights of Dr. Kuper's independent study include:

?? The Micromem research team, headed by Dr. Harry Ruda of the University of Toronto, has demonstrated the ability to design and fabricate memory cell components for a variety of applications.

?? Micromem's research team has planned the development of a 96-bit memory array, which will be aimed at new applications in the RFID (Radio Frequency Identification) market, by relying upon a combination of unique advantages.

?? Micromem has solved some key bottleneck issues associated with magnetic memory.

"We're pleased with the results of Dr. Kuper's independent review of our company." said Joseph Fuda, President and CEO of Micromem, "which validates the years we have invested in developing our magnetic memory cell components."

Micromem retained the services of Dr. Cynthia Kuper to assess the magnetic memory currently under development by the Micromem research team, as she is a highly-regarded expert and independent consultant in the area of emerging technology. As founder and President of Versilant Technologies, she won a NASA contract to develop high-strength composite materials, for which she was nominated for an innovation award. Dr. Kuper has worked extensively in developing, enabling technologies for the commercial use of carbon nano-tubes and commercialization of nano-scale related technologies. She received her B.S. and Ph. D. in chemistry from Temple University, and completed a post-doctoral fellowship in the laboratories of Nobel Laureate Rich Smalley at Rice University in Houston, where she worked through a cooperative agreement with NASA at the Johnson Space Center.

Excerpts from Dr. Kuper's "State of the Technology Report" are attached to this press release.

About Micromem Technologies Inc.

Over the last 5 years, Micromem has been devoted to the development of MRAM technology.
Once developed, this technology will be suitable for various applications including Radio

Frequency Identification (RFID) tags, which will be the company's first market objective. All MRAM development work is undertaken pursuant to research collaboration agreements among Micromem, the University of Toronto, Dr. Harry Ruda and OCE Inc., a not-for-profit member based organization formed from the merger of Materials and Manufacturing Ontario, CITO and other agencies. Micromem holds the first right to an exclusive, world-wide and perpetual sub-license for the use of the technology subject to royalty payments to OCE Inc. Permitted uses of the technology under the license shall consist of the use, development, design, manufacture, license, sub-license and sale of memory cells and data storage devices incorporating the technology exclusively throughout the world.

For further information, please contact Joseph Fuda, President and C.E.O., at tel. 1-877-388-8930.

Statements in this news release that are not historical facts, including statements about plans and expectations regarding products and opportunities, demand and acceptance of new or existing products, capital resources and future financial results are forward-looking. Forward-looking statements involve risks and uncertainties, which may cause the Company's actual results in future periods to differ materially from those expressed. These uncertainties and risks include changing consumer preferences, lack of success of new products, loss of the Company's customers, competition and other factors discussed from time to time in the Company's filings with the Securities & Exchange Commission.

No securities regulatory authority has approved or disapproved of this news release.

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State of the Technology Report

This report consists of excerpts from Dr. Cynthia Kuper's State of Technology Report received by Micromem Technologies Inc. on September 28, 2004. The excerpts below have been prepared with the intent to protect Micromem's intellectual property and current developmental technology while allowing for disclosure of the current state and activity of the company.

Micromem's Technology

Micromem Technologies Inc.'s (MMT's) research team, headed up by Dr. Harry Ruda of the University of Toronto, has demonstrated the ability to design and fabricate memory cell components for a variety of applications. The memory cell has been designed and the key elements of the cell have been the subject of a pending patent application. The MMT research team is able to fabricate components of the memory cell and is awaiting its next milestone, which is to assemble the components of the memory cell into a working device. MMT's technology development is aimed at the RFID market and additional target markets would include cell phones and PDA's. The physics of MMT's technology allows for it to be scaled, for example the storage medium, which is the magnetic bit, stays the same however the potential to evolve the read write process to convert 1 bit into a multiple bit cell exists.

MMT's technology is currently on the micron scale and can be further reduced in size and consequently the memory can be made denser. Harry Ruda's laboratories use industrially viable processes like electron beam lithography, photolithography, etching and vapor deposition to create the MMT memory components.

The objective of MMT's planned 96-bit memory array is to propel the RFID market into item level tagging by relying upon a combination of unique advantages.

MMT's Technical Edge

MMT has solved some key bottleneck issues associated with magnetic memory.

Magnetic memory suffers from several problems. Two major problems are:

1) Interference between neighboring magnetic bits or "cross-talk". This is a major bottleneck in implementing magnetic memory. This problem impedes the ability to have a successful "read" process.

   Harry Ruda has filed a provisional patent application in August of this year on a specific solution for this bottleneck to be implemented in the MMT memory cell.

2) Material fatigue. This problem limits the number of read/write cycles in a lifetime of a memory bit. The material cracks, deforms and then stops working.

   The storage medium in MMTs memory cell is not subjected to the same stress as other magnetic memory devices and therefore will have enhanced performance. This is due to the nature of the mechanism of data storage in MMTs memory cell, which negates the common mechanism of material failure in other memory systems.

Memory Technologies
Volatile memory devices

Volatile memory devices are not directly competitive to MMT's technology. They fall into a separate class of memory. Volatile memory loses its stored information when the power is shut off. It is important to note what the common types of volatile memory are that are being worked on today, should applications intersect and also to help define MMT's sector. Examples of volatile memory include SRAM, DRAM and MOSFET.

Non-Volatile Memory Devices

Non-volatile memory retains its information when the power is shut off. There are many examples of this type of memory device many of them are directly competitive to MMT, as MMT's technology is a form of MRAM for non-volatile memory.

MRAM

MRAM, magnetoresistive random access memory, is a large segment of non-volatile memory encompassing many variations of the technology. The computer industry, as a whole, is looking towards MRAM as a replacement technology for EEPROM and FLASH and current DRAM, making all memory dense, fast and non-volatile.

"The potential market for MRAM is big. It is expected to eventually become the memory standard for future electronics, replacing DRAM. In 1999, the DRAM market was $21 billion." Kevin Bonsor, Howstuffworks.com

"Magnetic RAM chips have the potential to replace all computer memory RAM technologies in use today and can lead to instant-on computers and longer battery life for pervasive devices." www.IBM.com

Competitive Technology

Non-Volatile Memories currently in use

EEPROM- electrically erasable programmable read-only memory, EEPROM is similar to flash memory (sometimes called *flash EEPROM*). The principal difference is that EEPROM requires data to be written or erased one byte at a time whereas flash memory allows data to be written or erased in blocks. This makes flash memory faster. EEPROM also has a limited life - that is, the number of times it can be reprogrammed is limited to tens or hundreds of thousands of times. [1]

FLASH- A special type of EEPROM that can be erased and reprogrammed in blocks instead of one byte at a time. Many modern PCs have their BIOS stored on a flash memory chip so that it can easily be updated if necessary. Such a BIOS is sometimes called a flash BIOS. [2]

[1] http://www.webopedia.com/TERM/E/EEPROM.html
[2] http://computer.howstuffworks.com/flash-memory.htm

MRAM- MRAM (magnetoresistive random access memory) is a method of storing data bits using magnetic charges instead of the electrical charges used by DRAM, EEPROM and Flash. It is currently used on a limited basis.

Future Non-Volatile Memory

In the following non-volatile memory areas there is on going research and development. At some point in the future these technologies will have to be examined with respect to their implications for MRAM. Examples of some types of these technologies are:

s-MOSFET- This is a form of MOSFET driven by spin, not voltage or current. One place in particular to watch is the work being done at University of Tokyo which would make the technology non-volatile and a direct future competitor of MMT.[3]

SDT- Spin Dependent Tunneling. This is similar to MRAM but uses "spin" to induce data storage.

NRAM –Nanotube-based/Nonvolatile RAM- based on architectures and logics from carbon nanotubes. It is poised to take over DRAM, SRAM and NVRAM. It competes directly with phase change RAM and Magnetic RAM. [4] It also uses conventional fabrication techniques.

Molecular Computing- uses individual molecules. They can be semi-conducting large molecules or molecules attached to molecular tubes. The molecules undergo a chemical change. This change can be measured by loss or gain of a single electron. Thus each electron is "bit".

Background of key personnel

Harry Ruda
Lead scientist for MMT

Harry Ruda received the B.Sc. degree in materials physics with honors from Imperial College, London University, England, in 1979, and the Ph.D. degree from Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, in 1982, for work on growth and characterization of HgCdTe for infrared detectors. Following these studies, he accepted an IBM postdoctoral fellowship to work on defect calculations in GaAs and transport in low dimensional GaAlAs-based quantum heterostructures. In 1984 he joined 3M where his work focused on theoretical optical and transport properties of wide bandgap II-VI semiconductors, principally ZnSe-based. In 1989, Dr. Ruda joined the University of Toronto and now holds the position of Full Professor. He currently is also the Energenius Advanced Nanotechnology chair holder, and director of the Energenius Centre for Advanced Nanotechnology.

Unlike many academics, Professor Ruda is keenly aware of industrial specifications and factors concerning commercial viability. Professor Ruda's laboratory speaks to that point in many ways, most significantly in that all of the fabrication procedures used to develop MMT's technologies follow industry standard protocol. Professor Ruda has an excellent sense of the competitive

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[3] MRS Bulletin, May (2004) 302.
[4] "Carbon nanotubes rewrite memory rule book", Chris Mellor, Techworld.com, May, 07 (2004) 17:01:57.

landscape in MRAM. He directs his development of MMT's technologies in accordance with his knowledge of competing technologies and his know how of the field to ensure MMT's MRAM technology is competitive.

Stéphane Aouba
Associate Scientist for MMT

Responsible for the development of magnetic non-volatile memory device in collaboration with our industrial partner Micromem Technologies Inc.

Education

University Paul Sabatier of Toulouse /LAAS-CNRS -France **1993-1997**
Ph.D. in Microelectronics/Microsystems,. Research works done at LAAS - CNRS
Thesis: "Conception and Realization of an integrated photovoltaic conversion Microsystem".

University Paul Sabatier of Toulouse / LAAS-CNRS **1992-1993**
D.E.A. (Diploma of Advanced Studies) in Microelectronics (Master)

University Paul Sabatier **1990-1991**
Bachelor Science (Physics)

Dr. Aouba has extensive training in engineering and fabrication of electronic devices. His expertise in those areas as well as his management experience with clean room facilities is extremely valuable to the creation and maintenance of MMTs technology. Dr. Aouba is personable, articulate and good communicator. He manages and executes the fabrication of MMTs technology, which he co develops with Professor Ruda. Dr. Aouba's in depth understanding of microelectronics and fabrication know how makes him a propellant of MMTs technology.

Information for the reader

As evidenced in this report Micromem Technologies Inc. is a research and development company working on MRAM technologies. It is seen from the information presented here that MRAM is a very competitive sector. Working in competitive sectors in technology bares risk. The value proposition for MMT is in the high risk areas of competitive R&D because this is the opportunity for high reward. MMT has many valuable assets that will aid in the company's growth and competitive outcome. MMT has been developing MRAM technology for over five years. MMT has a valuable network of investors and prospective customers. MMT has a top tier team of scientists.