INNOVATIVE MASS STORAGE TECHNOLOGIES

IMST WHITE BOOK

December 2007

Mass data storage, memories for the future everyday life

A road map for the European R&D

The Specific Support Action **WIND**, funded by the **European Union** within the the 6th research framework programme (FP6), supports the edition of the IMST White Book.

Acknowledgements

The contributors to this White Book are all currently active researchers, engineers or academics working in the area of mass data storage technologies in industry, universities or research centres within the European Union. Particular thanks for the preparation of this 2007 edition are due to Prof Claude Chappert of the University de Paris Sud, Drs Luc Haspelagh and Dirk Woutters of IMEC, Prof Dr Matthias Wuttig from RWTH_Aachen, Prof David Wright from the University of Exeter, Dr Yves Samson from CEA-Grenoble. We are particularly grateful once again for invaluable contributions from Drs Livio Baldi and Roberto Bez (ST Microelectronics / Milano, Italy) and Dr Doris Keitel-Schulz (Infineon / Munich, Germany).

Until 2006, the White Book was produced under the auspices of the scientific committee of the Innovative Mass Storage Technologies Conference (IMST). Created in 2000 by European scientists and industrialists, this International Conference provides a unique opportunity to cover the latest advancements of research and to observe the latest trends in the areas of solid state, optical, magnetic and emerging technologies for data storage - see http://www.imst.org

Since 2007, **the elaboration of the IMST White Book has been supported by the European Union FP6** programme as being one of the actions implemented within the Specific Support Action WIND: Wide INtegrated technology Dissemination - see http://www.wind-fp6.org.

2007 IMST White Book

Partners from the SSA WIND having contributed to the 2007 IMST White Book are:

Bernard BECHEVET (CEA - Leti / Grenoble, France)
WIND coordinator

Yves SAMSON (CEA - DSM / Grenoble, France)
White Book coordination

David WRIGHT (Exeter University / Exeter, United Kingdom)
Emerging technologies

Claude CHAPPERT (CNRS- Université de Paris Sud, IEF / Orsay, France)
Magnetic memories

Matthias WUTTIG (RWTH Aachen / Aachen, Germany)
Optical Memories

Luc HASPELAGH and Dirk WOUTTERS (IMEC / Heverlee, Belgium)
Solid state memories

Other contributors to the 2007 IMST White Book

Livio BALDI, Roberto BEZ (ST Microelectronics / Milano, Italy)

Doris KEITEL-SCHULZ (Infineon / Munich, Germany)
Solid state memories

Dr Bernard Bechevet retired in June 2007. He is the co-founder of the cycle of IMST conferences and of the IMST White Book initiative. His energy and commitment at the workplaces and conferences will be deeply missed by his colleagues at CEA-LETI and indeed by all of the European data storage research community.

Contents

Section 1 first underlines the key role of Mass Data Storage in the Information and Communication Society and the proposed actions to strengthen the European position. **Section 2** offers an overview of the impact of Mass Data Storage on industry, economy and citizen life, and displays some of the most exciting opportunities opened in the near future. **Section 3** provides a thorough review of the technical trends, of the economic activity (with an incentive on the European position), in the four areas covered by the White Book: Solid State Memories, Optical Memories, Magnetic Memories and Emerging Technologies for Memories. In each case, the state of the European research is reviewed, and the authors underline what they consider the best actions to take to maintain and develop a strong EU based research and industry. **Section 4** is brief, but dedicated to a real challenge: how we will be able to transmit to the future the huge amount of data we create, using technologies that are so rapidly evolving. Finally **Section 5** gathers the views presented in each technical chapter to ensure the development and exploitation of appropriate R&D in Mass Data Storage Technologies in Europe. A short appendix list some current and past EU FP5 and FP6 funded research projects in the area of data storage and memory technologies.

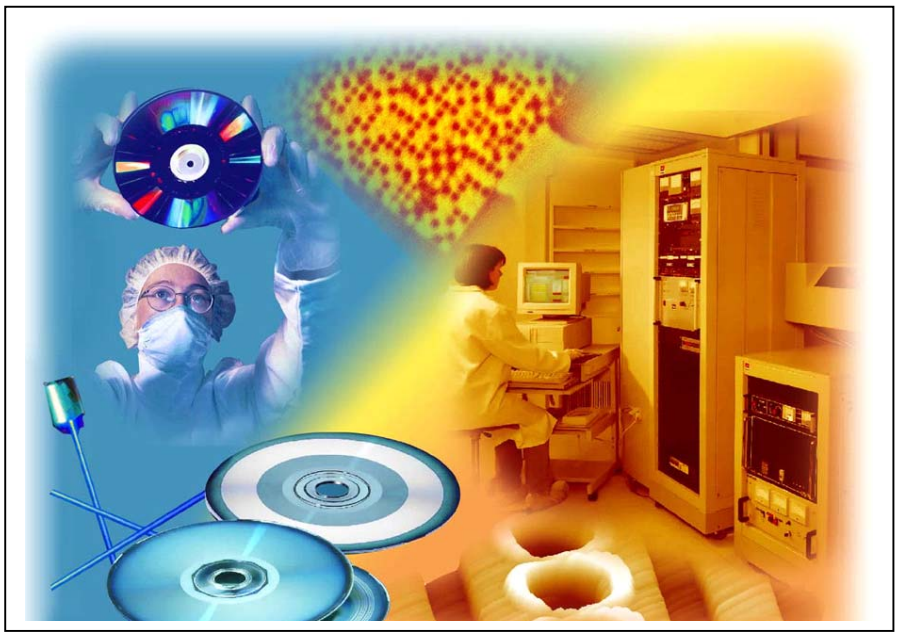

Image taken from the IMST Conference graphic files