

**MORIS**



**Joint MORIS / ISOM'97**

**MAGNETO-  
OPTICAL  
RECORDING  
INTERNATIONAL  
SYMPOSIUM**

**INTERNATIONAL  
SYMPOSIUM ON  
OPTICAL  
MEMORY**

**YAMAGATA INTERNATIONAL CONVENTION  
CENTER (Yamagata Big Wing), YAMAGATA, JAPAN**

**October 27-31, 1997**

**TECHNICAL  
DIGEST**

# TECHNICAL PROGRAM

(UN: Under Negotiation)

## October 28, 1997 (Tuesday)

### Welcome and Opening Remarks (10:00–10:20)

### Keynote Session (10:20–11:20)

**Presider:** A. Itoh (*Nihon Univ., Japan*)  
S. Kubota (*Sony, Japan*)

**Tu-A-01 (Keynote)**  
**10:20 Optical Storage; Science and Technology**  
Y. Mitsuhashi (*Nippon Sheet Glass, Japan*) ..... 2

**Tu-A-02 (Keynote)**  
**10:50 Nonlinear Magneto-Optics**  
T. Rasing (*Univ. of Nijmegen, Netherlands*) ..... 4

### Spin Electronics (11:20–12:10)

**Presider:** J.N. Chapman (*Univ. of Glasgow, U.K.*)  
Y. Suzuki (*NAIR, Japan*)

**Tu-B-01 (Invited)**  
**11:20 The Art of Spin Electronics**  
J.F. Gregg (*Univ. of Oxford, U.K.*) ..... 8

**Tu-B-02 (Invited)**  
**11:45 Magneto-optical Properties and Magnetization Reversal in Micro Fabricated Dots from Ultrathin Cobalt Layers**  
B. Bartenlian, J.-P. Jamet, P. Veillet, N. Bardou, F. Rousseaux\*, D. Decanini\*, P. Meyer, J. Ferre, S. Lemerle, C. Chappert, Y. Suzuki\*\* and P. Bruno  
(*CNRS Univ. Paris-Sud, \*Lab. de Microelectron. et Microstructures, France and \*\*Inst. for Advanced Interdisciplinary Res., Japan*) ..... 10

— Lunch (12:10 ~ 13:30) —

### Advanced Measurement I (13:30–14:40)

**Presider:** K. Sato (*Tokyo Univ. of Agri. & Technol., Japan*)  
T. Rasing (*Univ. of Nijmegen, Netherlands*)

**Tu-C-01 (Invited)**  
**13:30 The Direct Observation of Magnetisation Reversal in Films of Interest for High Density Information Storage**  
J.N. Chapman, J. Rose, I.S. Weir, I.S. Molchanov and D.M. Titterton  
(*Univ. of Glasgow, U.K.*) ..... 14

**Tu-C-02 (Invited)**  
**13:55 Combined Magneto-optic/Magnetic Force Microscopy**  
T. Pokhil (*Univ. of Minnesota, U.S.A.*) ..... 16

**Tu-C-03**  
**14:20 Scanning Near-Field Magneto-Optic Microscopy: Quantitative Determination of Faraday and Kerr Effects**  
P. Fumagalli, G. Eggers\*, A. Rosenberger\*, N. Held\* and A. Munnemann\* (*TU Braunschweig and \*RWTH Aachen, Germany*) ..... 18

— Coffee Break (14:40 ~ 15:00) —

## Advanced Measurement II (15:00–16:20)

President: T. Katayama (*ETL, Japan*) (UN)  
T. Pokhil (*Univ. of Minnesota, U.S.A.*)

- Tu-D-01**      **Quantitative Imaging of Magnetic Domains with the Transmission X-ray**  
**15:00**      **Microscope at Bessy I**  
P. Fischer, T. Eimuller, G. Schutz, P. Guttmann\*, G. Schmahl\*, K. Prueg  
l\*\* and G. Bayreuther\*\* (*Univ. Augsburg, \*Univ. Göttingen and*  
*\*\*Univ. Regensburg, Germany*) ..... 22
- Tu-D-02**      **The Spin SEM Observation of 0.1-É m Marks Recorded by Magnetic Field**  
**15:20**      **Modulation on an MO Disk**  
T. Kohashi, H. Matsuyama, K. Koike, Y. Tanaka, H. Awano\*  
and Y. Murakami\*\* (*Hitachi, \*Hitachi Maxell and \*\*Sharp, Japan*) ..... 24
- Tu-D-03**      **Theory of the Diffraction Magneto-Optical Effects of the**  
**15:40**      **2D-Magnetic Ellipsoids Array**  
Y. Suzuki, C. Chappert\* and P. Bruno\* (*NAIR, Japan and \*CNRS/URA, France*) ..... 26
- Tu-D-04**      **Magnetic Domain Dynamics in FeTb Thin Films**  
**16:00**      B. Lanchava, K. Matsumoto\* and H. Hoffmann  
(*Univ. of Regensburg, Germany and \*Fujitsu Labs., Japan*) ..... 28

— Break (16:20 ~ 16:30) —

## Multilevel & Domain Expansion Readout (16:30–18:30)

President: W. Mitchell (*Imation, U.S.A.*) (UN)  
M. Takahashi (*Hitachi, Japan*)

- Tu-E-01**      **Multi-Level Partial Response Recording in MO**  
**16:30**      M. Arai and S. Kobayashi (*Sony, Japan*) ..... 32
- Tu-E-02**      **Multi-Wavelength Read-out for Double Layered MO Disk**  
**16:50**      K. Nakagawa, A. Itoh, K. Shimazaki\*, M. Yoshihiro\* and N. Ohta\*  
(*Nihon Univ. and \*Hitachi Maxell, Japan*) ..... 34
- Tu-E-03**      **Multiple Pulse Response of MAMMOS Read-out**  
**17:10**      N. Takagi, A. Yamaguchi, Y. Uchihara, S. Sumi, H. Awano\*, H. Shirai\*  
and N. Ohta\* (*Sanyo Electr. and \*Hitachi Maxell, Japan*) ..... 36
- Tu-E-04**      **High-Density Magneto-Optical Recording with Domain Wall**  
**17:30**      **Displacement Detection**  
T. Shiratori, E. Fujii, Y. Miyaoka and Y. Hozumi (*Canon, Japan*) ..... 38
- Tu-E-05**      **Magnetic Expansion of the CAD Disk with a TM-rich GdFe Layer**  
**17:50**      K. Takahashi and K. Katayama (*Tosoh Electron., Japan*) ..... 40
- Tu-E-06**      **Light Intensity Modulation Type Magnetic Domain**  
**18:10**      **Expansion Readout MO (LIM MAMMOS)**  
K. Shimazaki, H. Watanabe, M. Yoshihiro, H. Awano,  
H. Takao, Y. Xiao\* and N. Ohta (*Hitachi Maxell, Japan and \**  
*Royal Inst. of Technol., Sweden*) ..... 42

## October 29, 1997 (Wednesday)

### Short Wavelength Recording (9:00–10:35)

President: R.H. Victora (*Eastman Kodak, U.S.A.*)  
Y. Honguh (*Toshiba, Japan*)

We-F-01	(Invited)		
9:00	Application of SHG Blue Laser to Optical Disk		
	M. Kato, Y. Kitaoka, K. Yamamoto and K. Mizuuchi		
	( <i>Matsushita Electr., Japan</i> ) .....		46
We-F-02	(Invited)		
9:25	Short Wavelength Phase Change Recording R. van Woudenberg		
	( <i>Philips, Netherlands</i> ) .....		48
We-F-03	(Invited)		
9:50	Study of Magneto-Optical Kerr Effect beyond 5 eV-Co Alloys and Multilayers		
	W. van Drent and T. Suzuki ( <i>Toyota Technol. Inst., Japan</i> ) .....		50
We-F-04	The Path from DVD (Red) to DVD (Blue)		
10:15	F. Yokogawa, S. Ohsawa, T. Iida, Y. Araki, K. Yamamoto and Y. Moriyama		
	( <i>Pioneer Electron., Japan</i> ) .....		52

— Coffee Break (10:35 ~ 10:50) —

### 2 Gbit/inch<sup>2</sup> Technologies (10:50–12:10)

President: M. Mansuripur (*Univ. of Arizona, U.S.A.*)  
J. Saito (*Nikon, Japan*)

We-G-01	Write-Once Type Dual-Layer Optical Disk Using Te-O-Pd		
10:50	Phase-Change Films		
	K. Nishiuchi, H. Kitaura, N. Yamada and N. Akahira ( <i>Matsushita Electr., Japan</i> ) .....		56
We-G-02	Optical Design for a Double DVD-RAM Phase Change Disc		
11:10	J.M. Bruneau, B. Bechevet and C. Germain ( <i>LETI, France</i> ) .....		58
We-G-03	CNR Improvement of Conventional LIMDOW Media for Higher		
11:30	Density Recording		
	A. Okamuro, T. Hosokawa, M. Hashimoto, A. Sakemoto,		
	T. Sugiyama*, N. Ogihara*, I. Kimura**, K. Miyata** and		
	T. Niwa** ( <i>MNOptical, *Hitachi Maxell and **Nikon, Japan</i> ) .....		60
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— Lunch (12:10 ~ 13:30) —

### Advanced Materials for Optical Recording (13:30–14:45)

President: M. Kaneko (*Sony, Japan*)  
J.M. Bruneau (*LETI, France*)

We-H-01	(Invited)		
13:30	Phase-Change Optical Disks for a High Data Transfer Rate		
	M. Okada, M. Ogawa, M. Kubogata, S.-I. Ohkubo and M. Itoh ( <i>NEC, Japan</i> ) .....		66

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		R.H. Victora, C.F. Brucker, T.K. Hatwar, J.E. Hurst*, B. Uryson* and D. Karns** ( <i>Eastman Kodak, *IBM Almaden Res. Center and **Carnegie Mellon Univ., U.S.A.</i> ) .....	68
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<b>14:20</b>		<b>5 Gbit/inch<sup>2</sup> MO Technology</b>	
		A. Takahashi, M. Kaneko*, H. Watanabe**, Y. Uchihara*** and M. Moribe** ** ( <i>Sharp, *Sony, **Hitachi Maxell, ***Sanyo Electr. and ***Fujitsu Labs., Japan</i> ) .....	70
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	<b>President:</b>	<b>N. Miyagawa (<i>Matsushita Electr., Japan</i>)</b> <b>S.-C. Shin (<i>KAIST, Korea</i>)</b>	
<b>We-I-01</b>		<b>High-Density Recording Capability of Five-Layered Phase-Change Optical Disc</b>	
<b>15:00</b>		N. Nakamura, N. Morishita, K. Suzuki, K. Yusu, K. Ichihara, M. Kuwahara, H. Hasegawa and H. Kobori ( <i>TOSHIBA, JAPAN</i> ) .....	74
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— Reception (19:20 ~ 21:20) —

### October 30, 1997 (Thursday)

#### Key Components (9:00–10:25)

**Presider:** T. Suhara (*Osaka Univ., Japan*)  
C.W. Lee (*Samsung Electron., Korea*)

<b>Th-J-01</b>	<b>(Invited)</b> <b>9:00 Lens Design for CD/DVD Compatible Optical Heads</b> Y. Tanaka ( <i>Matsushita Electr., Japan</i> ) .....	160
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— Coffee Break (10:25 ~ 10:40) —

#### Domain Dynamics & High Density MO Recording (10:40–12:05)

**Presider:** P. Fumagalli (*TU Braunschweig, Germany*)  
A. Nakaoki (*Sony, Japan*)

<b>Th-K-01</b>	<b>(Invited)</b> <b>10:40 Reading Dynamics in Magnetic Super Resolution Media</b> M.H. Kryder, M. Du, S.E. Kabakoff and D.C. Karns ( <i>Carnegie Mellon Univ., U.S.A.</i> ) .....	170
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— Lunch (12:05 ~ 13:30) —

**Ultra High Density Optical Recording (13:30–15:45)**

**President:** M.H. Kryder (*Carnegie Mellon Univ., U.S.A.*)  
H. Sakeda (*Hitachi, Japan*)

<b>Th-L-01</b> <b>13:30</b>	<b>(Invited)</b> <b>High Speed Near Field Optical Technology for Ultrahigh Density Storage</b> M. Ohtsu ( <i>Tokyo Inst. of Technol., Japan</i> ).....	180
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**Poster Session Th-Q (16:00–18:00)**

**Components, Systems & Future Technologies**

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**Night Session (18:00–20:00)**

**Presider:** T. Suzuki (*Toyota Technol. Inst., Japan*)  
T. Toshima (*NTT, Japan*)

**Title:** 20 Gbyte Memory Technologies

<b>NS-1</b>	<b>Optical Storage in IT Industry</b>
<b>NS-2</b>	<b>Road Map for Optical Storage</b>
<b>NS-3</b>	<b>Future MO</b>
<b>NS-4</b>	<b>Future DVD</b>

October 31, 1997 (Friday)

**Drive Technology (9:00–11:10)**

**Presider:** J.A. Th. Verhoeven (*ODME, Netherlands*)  
H. Iwasaki (*Ricoh, Japan*)

<b>Fr-M-01</b>	<b>(Invited)</b>		
<b>9:00</b>	<b>Mechanical Technologies of Magneto-Optical Disk Drives</b>		
	J.-I. Ichihara ( <i>Fujitsu Labs., Japan</i> ).....		276
<b>Fr-M-02</b>	<b>(Invited)</b>		
<b>9:25</b>	<b>A CD-R Compatible DVD Pickup with a Lens for 780 nm and 650 nm Wavelengths</b>		
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<b>Fr-M-03</b>	<b>A PRML Simulator to Evaluate the Influence Caused by Various Kinds of Deterioration Factors in Optical Discs</b>		
<b>9:50</b>	Y. Kashihara, Y. Sakai, Y. Okamoto and H. Kobori ( <i>Toshiba, Japan</i> ).....		280
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<b>10:10</b>	T. Mori, A. Mizugaki and Y. Ohba ( <i>NTT, Japan</i> ) .....		282
<b>Fr-M-05</b>	<b>Phase-Change Optical Disk Applied to DVD-Authoring-Systems</b>		
<b>10:30</b>	K. Nagata, T. Saimi, S. Furukawa, K. Nishiuchi, N. Yamada and N. Akahira ( <i>Matsushita Electr., Japan</i> ) .....		284
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— Coffee Break (11:10 ~ 11:25) —

**Phase Change Disks & Mastering (11:25–13:10)**

**Presider:** R. van Woudenberg (*Philips, Netherlands*)  
T. Ohta (*Matsushita Electr., Japan*)

<b>Fr-N-01</b>	<b>High Density Optical Disc with Ag-In-Sb-Te Phase Change Recording Material</b>		
<b>11:25</b>	H. Deguchi, M. Shinotsuka, H. Yuzurihara, M. Kinoshita, M. Harigaya, M. Abe and Y. Kageyama ( <i>Ricoh, Japan</i> ) .....		290
<b>Fr-N-02</b>	<b>Nitrogen Doping Effect of Phase Change Optical Disks</b>		
<b>11:45</b>	R. Kojima, S. Okabayashi, T. Kashihara, K. Horai, T. Matsunaga*, E. Ohno, N. Yamada and T. Ohta ( <i>Matsushita Electr. and *Matsushita Technoresearch, Japan</i> ) .....		292
<b>Fr-N-03</b>	<b>Phase-Change Optical Disk for DVD-RAM Having an Interface Layer</b>		
<b>12:05</b>	N. Yamada, M. Otaba, K. Kawahara, N. Miyagawa, H. Ohta, N. Akahira and T. Matsunaga* ( <i>Matsushita Electr. and *Matsushita Technoresearch, Japan</i> ) .....		294
<b>Fr-N-04</b>	<b>(Invited)</b>		
<b>12:25</b>	<b>Write Precompensation Technique in a Mastering Process</b>		
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**12:50** T. Higuchi, Y. Okumura and T. Iida (*Pioneer Electron., Japan*) ..... 298

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