

## Optical Data Storage 2010 Program-At-A-Glance

	<b>23 May 2010 Sunday</b>	<b>24 May 2010 Monday</b>	<b>25 May 2010 Tuesday</b>	<b>26 May 2010 Wednesday</b>
8:15 to 8:30 am		Opening Remarks		
8:30 to 10:00 am	Course on Plasmonics and Its Application	MA Holographic Recording/Techniques	TA Near-Field Recording	WA Nanophotonics
10:00 to 10:30 am	<b>Break</b>			
10:30 to 12:00 pm	Course on Near Field Optical Transducers	MB Microholographic Recording	TB Super Resolution and Hybrid Systems	WB Multidimensional Recording
12:00 to 1:30 pm	<b>Lunch</b>			
1:30 to 3:00 pm	Course on Microholographic Recording	MC Drive Technologies and Components	TC Holographic Recording/Compone nts and Media	WC Advanced and Related Technologies
3:00 to 3:30 pm	<b>Break</b>			
3:30 to 5:00 pm	Course on Holographic Data Storage	MD Systems and Applications	TD Future Emerging Technologies	WD Post Deadline
5:15 to 6:45 pm		MP Poster Session		Closing Remarks
7:00 to 8:30 pm		Welcome Reception		

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## Invited Presentations

### **SESSION MA: Holographic Recording/Techniques**

*Coherent techniques for terabyte holographic data storage*, **Mark R. Ayres**, InPhase Technologies Inc. (United States) [7730 01]

### **SESSION MB: Microholographic Recording**

*A systematic comparison of bit-based and page-based holographic storage systems*, **Yuzuru Takashima**, Lambertus Hesselink, Stanford Univ. (United States) [7730 06]

### **SESSION MC: Drive Technologies and Components**

*Development of compact femtosecond fiber laser and alignment free confocal system for multilayered optical memory*, **Yoshimasa Kawata**, Shizuoka Univ. (Japan) and Japan Science and Technology Agency (Japan) [7730 11]

*512 GB recording on 16-layer optical disc with Blu-ray Disc based optics*, **Motohiro Inoue**, TDK Corp. (Japan) [7730 12]

### **SESSION MD: Systems and Applications**

*New video disc (NVD) for high-density storage*, **Xiangshui Miao**, Huazhong Univ. of Science and Technology (China) [7730 16]

*Characterization of media for optical data storage*, **Ding Ping Tsai**, National Taiwan Univ. (Taiwan) [7730 17]

*Next generation optical disc system with Super-RENS ROM disc*, **Masayuki Ohmaki**, Mitsubishi Electric Corp. (Japan) [7730 72]

### **SESSION TuA: Near-Field Recording**

*Recent developments in near field optical transducers for data storage*, **Lambertus Hesselink**, Stanford Univ. (United States) [7730 18]

*High density recording with SIL-based near-field optical recording*, **Jin-Hong Kim**, LG Electronics Inc. (Republic of Korea) [7730 19]

### **SESSION TuD: Future Emerging Technologies**

*State of R&D in photonics-related fields in Japan's industry and academia: leading the 'green digital economy'*, **Kimio Tatsuno**, OITDA/Hitachi Ltd. (Japan) [7730 34]

*Advanced CROP recording materials for emerging technologies*, **David Waldman**, STX Aprilis, Inc. (United States) [7730 36]

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## SESSION WA: Nanophotonics

*Novel nano-structures and fabrication techniques with applications in plasmonic data storage*, **Sang-Hyun Oh**, Univ. of Minnesota, Twin Cities (United States) [7730 39]

*Single photon source based on color center in diamond nanowire*, **Marko Loncar**, Harvard Univ. (United States) [7730 40]

*Single spins in diamond for quantum networks and magnetic sensing*, **Gurudev Dutt**, Univ. of Pittsburgh (United States) [7730 41]

*Trapped rainbow for storage of light in nanophotonic materials*, **Ortwin Hess**, Univ. of Surrey (United Kingdom) [7730 42]

## SESSION WB: Multidimensional Recording

*Five-dimensional optical data storage*, **Min Gu**, Swinburne Univ. of Technology (Australia) [7730 43]

*Two-photon sensitized recording materials for multilayer optical disk*, **Masaharu Akiba**, FUJIFILM Corp. (Japan) [7730 44]

*A possible solution for the next generation of optical data storage*, **Peter Török**, Imperial College London (United Kingdom) [7730 45]

## SESSION WC: Advanced and Related Technologies

*Finite difference time domain computer simulations with applications to optical data storage*, **Armis R. Zakharian**, Corning Inc. (United States) [7730 46]

*A broadly achromatic, biological quarter wave retarder*, **Nicholas Roberts**, The Univ. of Manchester (United Kingdom) [7730 47]

*Full high-definition digital 3D holographic display and its enabling technologies*, **Xuewu Xu**, A\*STAR - Data Storage Institute (Singapore) [7730 48]

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## Sunday Short Courses

### Course on Plasmonics and Its Application to Optical Data Storage

Instructor: Din Ping Tsai, National Taiwan Univ. (Taiwan)

Course Description: This short course will cover the background of plasmonics and basic properties of plasmons, and its applications to optical data storage. Principle of plasmons and localized plasmons will be addressed. Advanced applications of plasmonics on the optical data storage will be reviewed. Field enhancement and optical nonlinearity of the plasmons for optical data storage systems and applications will be discussed.

### Course on Near-Field Optical Transducers for Data Storage

Instructor: Lambertus Hesselink, Stanford Univ. (United States)

In this short course we will discuss the fundamentals of creating nano-optical spots using near field transducers (NFT). In the literature a number of innovative approaches have been studied that allow light concentration to spots  $<\lambda/20$  in size. The most heavily studied are the bow-tie aperture, the C-aperture and its variants, as well as the Puccini system. Much has been learned from these studies about how light interacts with metals to produce surface plasmon resonances that can give rise to anomalous increases in intensity while maintaining a deep sub-wavelength spot size.

In the presentation, we will try to put the NFT knowledge into a unifying framework based on mathematical topology of the Poynting vector flow field. This knowledge provides the basis for designing NFTs. We use this framework to evaluate the performance of various NFTs for a number of applications, including EAMR and near-field optical recording.

### Course on Microholographic Recording

Instructors: Robert R. McLeod, Univ. of Colorado and Susanna Orlic, Technische Univ. Berlin (Germany)

Course Description: This short course will cover the use of focused lasers to record small, isolated holograms in thick media. Architectural choices include recording schemes and multiplexing, the arrangement of read/write heads, direct versus homodyne detection, recording laser and modulation methods and servo methods such as stamped cover layers and servo-writers. Possible material systems will be reviewed including holographic photopolymers, photochromic, thermoplastic and inorganic materials. Demonstrated performance in the various groups world-wide will be summarized. Finally, modeling methods will be discussed and potential performance suggested.

### Course on Holographic Data Storage

Instructor: Kevin Curtis, InPhase Technologies

Course Description: This short course addresses the fundamental principles and design issues pertaining to digital holographic data storage (HDS). The fundamental principles of holography, including formation of and diffraction from thick diffraction gratings, are explained. Multiplexing techniques for thick gratings based on Bragg, momentum, or correlation techniques are discussed and explained with an introduction to k-space analysis.