

While scanning the book, questions came up regularly but each time the answer was found only a few pages away demonstrating the tight organization of the material. One slight detraction was the constant use of 3-letter abbreviations with seldom a repetition of the originating phrase. Fortunately their excellent index serves well as a glossary.

This book will function well as a structured textbook for a course on modeling digital board level systems as well as a reference for a practicing engineer asked to design and model something a bit beyond normal expertise. The extensive references at the end of each chapter allow further digging into any topic needing further understanding for a particular application.

Conference Reviews:

Conference Report from ESTC 2008

Submitted by Nihal Sinnadurai & Chris Bailey

Report & photos: www.cpmt.org/docs/0809estc.pdf

The 2nd Electronics System-Integration Technology Conference (ESTC-2008) was held at the magnificent buildings of the historic Old Royal Naval College on the banks of the River Thames in Greenwich, London from September 1-4, 2008. This premier international conference is held every two years in Europe and brings together scientists, engineers and managers in the field of micro and nano electronics, photonics, MEMS, and bio components, their integration and packaging.

ESTC-2008 was organised jointly by the University of Greenwich and the UK&RI Chapter of IEEE-CPMT and sponsored by CPMT-IEEE, the University of Greenwich, and supported by IMAPS-Europe. The conference complements the corresponding CPMT global conferences ECTC and EPTC held in the USA and Singapore respectively and the European EMPC organised by IMAPS-Europe. The collaboration agreement in Europe results in us sharing alternate years for ESTC organised by IEEE-CPMT in Europe and EMPC organised by IMAPS-Europe. In this way we serve the interests of the delegates to provide ongoing major conferences without diluting the resource to deliver them.

The Executive and Technical Programme committees of the 2nd ESTC extend their sincere thanks to all the authors, presenters, short course instructors, session chairs, exhibitors, sponsors and delegates, who helped make ESTC-2008 a resounding success.



A Truly International Event

Contributions from 32 countries made ESTC-2008 a truly global conference. Authors from academia, industry and research institutes presented 252 papers at forty oral sessions and eight poster sessions to 384 delegates. Nine professional development courses attended by 67 participants on the preliminary day of the Conference added to the technical excellence of the event.

The strong technical range of the conference papers and courses covered the technical themes of Advanced Packaging, Emerging Technologies, Healthcare, Manufacturing & Test, New Materials and Processes, Modelling and Simulation, Optoelectronics, Reliability and special request topics such as Power Electronics and Assembly of Alternative Energy Sources. A themed technical exhibition with exhibits from 15 organisations, complimented the event and provided delegates with the opportunity to discuss commercial needs.

Special invited themes led and by international experts provided leading-edge insight in three technical themes on Prognostics and Health Management, Asia-Pacific Photo-Voltaics, and Standards, and a very special session on Greening the Blue Planet looked deeply into the impact and solutions that man and his technology has on the planet. 'When 'Technology Meets Market' provided constructive business decision insights from special panellists and knowledgeable delegates.

Greening the Blue Planet



Keynote lectures by Dr Nakita Vodjdani on the European Programme for Ambient Assisted Living, Dr Jean-Marc Yannou on SiP technologies and Dr Stuart Strickland who described Building Mobile Connectivity gave a great start to each conference day. The anchor Closing Session was chaired by Nihal Sinnadurai, the Executive Chair of ESTC-2008 and Chair of IEEE-CPMT-UK&RI. The session was kicked off with the Challenging Keynote by Professor Peter Cochrane on 'The Challenge of the Non-Linear' during which he asserted that systematic, i.e. linear, approaches were inadequate for the complex technology challenges of the future.

The Challenge of the Non-Linear

Prof. Peter Cochrane



Chris and Rolf



Nihal and Chris



Of course, this conference would not be complete without the awards of certificates and cheques from CPMT for the best papers and posters of the conference, and certificates to the organisers.

A Great Social Ambiance

We aimed to establish a strong social ambiance for ESTC and left a memorable impact, not least built on the wonderful World Heritage site. The Gala Dinner was in the fantastic historic Painted Hall with great atmosphere, great food and great entertainment – singers amongst the diners. Even the Exhibitors’ reception kept the delegates’ in the Exhibition Hall until the security guards had to encourage them to depart. The finale was the ‘River Cruise’ with the centrepiece the memorable journey on the panoramic ‘London Eye’.

The Gala Dinner



Conference Report ICEPT-HDP2008

Submitted by Prof. Keyun BI, President of China Electronic Packaging Society, Mr. Ronnie LI, Executive Director of China Electronic Packaging Society, China, and Dr. William Chen, CPMT Society President.

The Joint International Conference on Electronic Packaging Technology & High Density Packaging (ICEPT-HDP2008) was successfully held from the 28th to 31st of July in Shanghai, China. This conference attracted 280 abstracts and col-

lected 250 papers. Almost 400 people from 13 countries or regions attended this conference. The Program included: opening speech by Prof Bi, CEPS, 10 keynotes, 150 oral presentations and 100 papers in poster session. Additionally, 3 workshops, including an ITRS Workshop and 4 training courses were held successfully.



The Leading People

The ICEPT-HDP2008 is organized / sponsored by China Electronic Packaging Society of China Institute of Electronics (CIE-CEPS), the Components, Packaging and Manufacturing Technology Society of the Institute of Electrical and Electronics Engineers (IEEE-CPMT), the International Microelectronics and Packaging Society (IMAPS), and Fudan University of China, with support from the Ministry of Industry and Information Technology, China, China Institute of Electronics, Shanghai Science and Technology Association, China, Shanghai Foreign Affairs Office, China, Shanghai Science Academy, China, Shanghai Integrated Circuit Industrial Association, China. Thanks to ASE Group, CPMT, ASTRI from Hong Kong, Shanghai Zhangjiang Group, Shanghai Xinyang Company, iNEMI, etc, who greatly helped to cover the conference expenses. Thanks to NXP who supported the Outstanding Paper Award and to CPMT and ASE who supported the Best Student Paper Award with Bonus. CPMT gave additional support to the Conference through it’s Distinguished Lecturer Program, which provided travel funding for several of the Keynote and Short Course Speakers.



The Chairman

Invited speakers included many of the leading people in the electronics packaging field for plenary keynotes, technical keynotes, or training courses, including Prof. Rao Tummala and Prof. C.P.Wong from Georgia Institute of Technology, USA; Prof. Michael Pecht from University of Maryland, USA; Prof. James Morris from Portland State University, USA; Dr. Cor Claeys from IMEC, Belgium; Prof. Tadatomo Suga from University of Tokyo, Japan; Mr. Steven Adamson from IMAPS, USA, Dr. Enboa Wu from ASTRI, Hong Kong, China, Prof. Ricky Lee from HUST, Hong Kong, China; Dr. Roy Yu from IBM, USA; Dr. Jim Huneke from Henkel, USA; Dr. Rainer Dudek and Dr. Rolf Aschenbrenner from Fraunhofer IZM, Germany; Prof. Xuejun Fan from Lamar University, USA; Prof. Johan Liu from Shanghai University, China; Dr. Lei Shan from IBM, USA; Dr. Daniel Lu from Henkel, China; Dr. N.C. Lee from Indium, USA; Dr. Ken Cheung from ASM, Hong Kong, China. Dr. William Chen, President of IEEE-CPMT; Mr. Steven Adamson, President of IMAPS and Dr. Jim McElroy, President from iMEMI came to congratulate the conference. Prof. Shichang Zhou, the academican from CAS and president of SICIA, came to congratulate and delivered a keynote speech.

The electronics packaging industry in China occupies over 50% of the output in the semiconductor industrial chain. Although at present, market demand in China focuses on middle or low-end packaging, more and more IC products from advanced packaging are needed day by day on a large scale. ICEPT-HDP provides a communicating platform for domestic and overseas experts, researchers, engineers on electronic packaging technology development and new ideas. This conference attracted people from well-known organizations, such as ASE, Intel, Henkel, Huawei, Freescale, Sumsung, Asymtek, JCET, ASTRI, and universities from China, such as Tsinghua University, Beijing University, Fudan University, Shanghai Jiaotong University, Huazhong University of Science and Technology, Hong Kong University of Science and Technology, Harbin Institute of Technology, South China University of Technology, Shanghai University, Nantong University, and research institutes such as Shanghai Institute of Microsystem and Information Technology of CAS, Hebei Semiconductor Research Institute, etc.



CPMT Student Paper Award

This successful conference represents a joining of the International Conference on Electronic Packaging Technology (ICEPT), previously organized by China Electronic Packaging Society, Chinese Institute of Electronics (CIE-CEPS), and the International Symposium on High Density Packaging (HDP), previously organized by Shanghai University. The strong, high-quality technical program, good organization and facilities put the Conference on the path to becoming one of the international brand conferences in the electronic packaging field, together with ECTC, ESTC and EPTC.



Opening Session



18th Annual IEEE Semiconductor Wafer Test Workshop (SW Test Workshop)
June 8 to 11, 2008
San Diego, CA

The 18th Annual IEEE Semiconductor Wafer Test Workshop (SW Test) was held at the Paradise Point Resort in San Diego, CA, from June 8 to 11, 2008. The conference consisted of a technical program, supplier exhibits (which ARE NOT open during the technical sessions), and plenty of time for informal interaction, social events, and great networking with colleagues. Within the broad technical program there were many in-depth presentations and a few embedded tutorials that provided background information for the advanced presentations and for those new to the wafer probe business. The total number of conference attendance was just under 500 with over 30% international attendees representing over 20 countries.

On Sunday afternoon, workshop started with an excellent survey presentation on I/O Pad and Bump Damage by Ken Karklin of Touchdown Technologies that was co-authored by several other probe technologists from the SW Test Program Committee. Ken gave an excellent overview of the causes, effects, metrology/characterization methods and the potential impact on assembly of uncontrolled I/O pad damage.

After dinner, Jerry Broz, Ph.D., SW Test General Chair, gave a fast-paced "Probe Year In Review" presentation after which the

Keynote Presentation, entitled "Wafer Test Industries Impact on ATE", was made by Debbora Ahlgren, Vice President and Chief Marketing Officer of Verigy, Inc. She outlined how demanding consumers are clearly in the driver's seat when defining the requirements for global electronics growth. She said, "The prevailing technology laws pushing the semiconductor industry forward are defined by the well-known Moore's Law (semiconductor capacity doubles every 18-months), lesser known Amdahl's Law (increasing throughput through parallelism) and Hwang's Law (Samsung has doubled semiconductor capacity every 12-months) were considered as the end-products have an ever-growing dependence on semiconductors. To keep up, relatively cost-effective approaches to testers, test strategies, and parallel-based wafer sort methods are needed and must keep evolving. Ahlgren noted that optimizing DRAM test cost versus parallelism is crucial when considering the dramatically increasing advanced probe card costs. To emphasize this point, Deb outlined the DRAM test cell cost breakdown shift from 1997 (~32 die per touchdown) when the probe card was 27%, tester was 63%, and prober was 6% to 2010 (~512 die per touchdown) where the probe card is 52%, tester is 42%, and prober is 4%. She also noted that our future has a critical need for innovation and collaboration – across the boundaries of design, test and fabrication – to support the "faster", "more" and "cheaper" that are the requisites of the consumer economy.

The 2008 technical program began on Monday morning with the Welcome and Lifetime Achievement Award session by Dr. Broz. The 2007 SW Test Lifetime Achievement Award was presented to Don Snow, who is now retired from Applied Precision, Inc. Don's career spans across almost 50-years in the semiconductor industry. Starting at Fairchild Semiconductor in 1959, Don made key contributions to the wafer sort industry through overseas business development, tester innovations, linear axis wafer prober development, and probe card metrology.



Pictures from Technology EXPO

Pictures from Technical Program

The next two days were filled with technical presentations covering every facet of the wafer test process from *MEMs for Production Probing* to *Improving Test Cell Performance*. Overall, this year's workshop had 35 podium technical presentations with 60% from suppliers, 18% from semiconductor manufacturers, and 22% joint presentations from manufacturer collaborating with suppliers. The **Best Presentation** was awarded to the team of Jan Martens (NXP Semiconductors - Hamburg), Simon Allgaier (FeinMetall, GmbH), and Jerry Broz, Ph.D. (International Test Solutions); **Best Data Presented** went to the technical team of John D. Wolfe, James Tong, and Norman Armendariz, Ph.D. (Texas Instruments); **Best Presentation, Tutorial in Nature**, went to the collaborative work by Steven T. Clauter (Integrated Technology Corporation) and Taichi Ukai (Taitech); the **Most Inspira-**

tional Presentation was awarded to the technical team of Jung Pyo, Dave Oh, and Kyung-hwan Kim (TSE, Ltd); the *Best Poster* went to Terence Q. Collier (CVInc) and David B. Rennie & Chuck Lhota (Air Products & Chemicals); and the infamous "*Golden Wheelbarrow Full of Crap for the Poorest Disguised Sales Pitch*" ... Well, let's just say, "what happens at SW Test stays at SW Test".

The Technology EXPO was expanded for 2008 and the number of exhibitors grew from 40 to 52 and the number of Corporate Supporters expanded to ten companies. During the EXPO, all aspects of the wafer sort industry and associated infrastructure suppliers were represented with over fifteen probe card vendors, two of the major prober manufacturers, probe card analyzer and probe process metrology companies (one company introduced a new on-line probe mark volume metrology approach), companies specializing in probe card cleaning, micro-pogo pin suppliers, and a variety of other probe related service providers. Many of advanced probe card manufacturers showed their new one-touch 300 mm probe cards. There were also 10 poster board presentations with the authors present to describe their activities and answer questions during specified times when the exhibits were open.

All the presentations (including the tutorials, keynote, technical program, and posters) from 2008 as well as previous workshops (1993 to 2007), are available on the SW Test website, <http://www.swtest.org>. Next year, the 19th Annual SW Test Workshop and EXPO will be held June 7 to June 10, at the Paradise Point Resort in San Diego. Abstract submission for podium and poster presentations will be open starting January 1, 2009.

MAKE PLANS NOW!

Attend the 59th **Electronic Components and Technology Conference** (ECTC 2009), being held May 25-29, 2009 in San Diego, CA USA. For more information, visit:

www.ectc.net

Watch for more information in the December CPMT Society Newsletter.

IEEE CPMT Society Newsletter

**Send inputs, suggestions, and
articles by email to
nsltr-input@cpmt.org**

..... Editor

Any technologist – **member or non-member** – is welcome to receive alerts when upcoming issues of our CPMT *Transactions* are posted to the IEEE's Xplore database and all the papers are available for downloading. This is a handy way to scan the issue's Table of Contents and quickly learn about novel approaches to packaging, modeling, reliability, materials, assembly and other topics.

The website link is:

ieeexplore.ieee.org/xpl/tocalerts_signup.jsp

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Here are the journals we suggest you select for monitoring:

- Advanced Packaging, IEEE Trans on
- Components and Packaging Technologies, IEEE Trans on
- Electronics Packaging Manufacturing, IEEE Trans on

Japan Institute of Electronics Packaging

A meeting was held at ECTC in Orlando, FL USA between members of the CPMT Board of Governors (including Bill Chen, Rao Bonda, Rolf Aschenbrenner and Charles Lee) and Dr. Yutaka Tsukada, President of JIEP. The objective is to develop further cooperation between the Society and JIEP, following CPMT's technical co-sponsorship of ICEP in Tokyo last summer.

JIEP was formed from former electronics packaging organizations and events, including ISHM/IMAPS-Japan, JIPC, the International Microelectronics Conference (IMC), and the CPMT Society's IEMT Symposium in Japan.

An article in the December issue of this Newsletter will give further details about JIEP and its activities, and some of the joint efforts that may be undertaken. Dr. Tsukada has been elected as a CPMT Society Distinguished Lecturer, so we may be hearing about some of his research in the coming years during talks at our Chapter meetings and conferences.