2012

International Conference on Nanojoining and Microjoining

December 2-5, 2012
Jin Chun Yuan Hotel, Tsinghua University, Beijing, China

Final Program

Partners and Sponsors：

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- European Federation for Welding, Joining and Cutting (EWF)
- Chinese Welding Society (CWS)

Welcome to NMJ 2012

On behalf of the conference committees, we would like to welcome you to this First International Conference on Nanojoining and Microjoining (NMJ 2012), Tsinghua University, Beijing, China, from December 2 to 5, 2012.

Joining, whether at macro-, micro-, or nano-scale, is used to fabricate almost all manufactured products in industrial sectors, such as electrical, electronic, medical, aerospace, automotive and nuclear, providing mechanical coupling and support, electrical connection or insulation, environmental protection, etc. While microjoining has already become one of the most critical technical prerequisites in manufacturing of micro-devices and micro-systems, new challenges continue to emerge for technology advancements to support faster and more reliable fabrication, continuing miniaturization, and cost reduction. On the other hand, nanojoining is now developing rapidly and is expected to become a key technology in commercial success of nano-devices and nano-systems.

NMJ 2012 aims to provide a forum for presentations and discussions of process and materials issues in the following theme areas:

- Joining for integration of nano-/micro-scale devices
- Microwelding for assembly of implantable medical devices
- Mechanisms and materials science of nano-/micro-joining
- Process issues in nano-/micro-joining

Finally, we would like to thank all the speakers, presenters, participants and sponsors for your support and participation. We hope all of you enjoy the conference and have fruitful discussions.

December 1, 2012

Norman Zhou	Akio Hirose
Conference Chair	Conference Co-Chair

Conference Committees

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Hongwei Zhu	Tsinghua University, China

Schedule of the Symposium

Time	**December 1, 2012 (Saturday)**	
14:00-18:00	**Registration**: Jin Chun Yuan Hotel, Tsinghua University	
	December 2, 2012 (Sunday)	
9:00-22:00	**Registration**: Jin Chun Yuan Hotel, Tsinghua University	
18:00-21:00	**Welcome Reception**: Restaurant, Jin Chun Yuan Hotel	
	December 3, 2012 (Monday)	
	Meeting Room 1	**Meeting Room 2**
8:00-8:10	**Opening Remarks**	—
	Keynote Presentation Session I	
8:10-8:50	KP-01 (F. Banhart)	
8:50-9:30	KP-02 (M. Breyen)	
9:30-9:45	**Photo Taking at the Hotel Gate**	
9:45-10:00	**Coffee Break**: Lobby	
	Keynote Presentation Session II	
10:00-10:40	KP-03 (S. Kang)	
10:40-11:20	KP-04 (O. Paul)	
11:20-12:00	KP-05 (Y. F. Zhang)	
12:00-13:00	**Lunch**: Restaurant, Jin Chun Yuan Hotel	
	Session I: Laser Nanojoining and Microjoining (LNM)	**Session II: 3D Electronics Packaging (3DEP)**
13:00-13:20	LNM-01 (Invited) (W. W. Duley)	3DEP-01 (Invited) (J. H. Zhang)
13:20-13:40	LNM-02 (T. Sano)	3DEP-02 (J. P. Jung)
13:40-14:00	LNM-03 (A. Hu)	3DEP-03 (S. Kirihara)
14:00-14:20	LNM-04 (M. L. Zhong)	3DEP-04 (Y. H. Tian)
14:20-14:40	LNM-05 (J. M. Chen)	3DEP-05 (K. Yasuda)
14:40-15:00	LNM-06 (A. Pequegnat)	3DEP-06 (C. J. Hang)
15:00-15:20	**Coffee Break**: Corridor	

	Meeting Room 1	Meeting Room 2
Time	**Session III: Medical Microwelding (MM)**	**Session IV: Micro-device Packaging (MDP)**
15:20-15:40	MM-01 (Invited) (M. I. Khan)	MDP-01 (Invited) (L. Quintino)
15:40-16:00	MM-02 (Y. D. Huang)	MDP-02 (L. P. H. Jeurgens)
16:00-16:20	MM-03 (R. Miranda)	MDP-03 (M. Y. Li)
16:20-16:40	MM-04 (Y. H. Chen)	MDP-04 (C. Yu)
16:40-17:00	MM-05 (M. Reiterer)	MDP-05 (X. J. Wang)
	Meeting Room 1 and Corridor	
	Poster Session (P)	
17:00-18:00	P-01 (F. W. Mu) P-02 (X. Wu) P-03 (Q. F. Zhou) P-04 (M. Ando) P-05 (S. Wang) P-06 (K. Kimura) P-07 (S. Takata) P-08 (Q. S. Su) P-09 (Y. Suzuki) P-10 (J. Milligan) P-11 (D. W. Heard) P-12 (T. Hiraki) P-13 (J. P. Jung) P-14 (A. Pequegnat) P-15 (L. C. Lin) P-16 (Y. C. Zhang) P-17 (F. W. Mu)	
18:00-19:00	**Dinner**: Restaurant, Jin Chun Yuan Hotel	

	December 4, 2012 (Tuesday)	
	Meeting Room 1	**Meeting Room 2**
Time	**Session V: Nanowelding (NW)**	**Session VI: Flip-chip Bonding (FCB)**
8:00-8:20	NW-01 (Invited) (B. J. Inkson)	FCB-01 (Invited) (T. Suga)
8:20-8:40	NW-02 (T. Ogura)	FCB-02 (J. Cai)
8:40-9:00	NW-03 (H. Y. Zhao)	FCB-03 (F. J. Wang)
9:00-8:20	NW-04 (T. Zhang)	FCB-04 (S. Fukumoto)
9:20-9:40	NW-05 (W. Guo)	FCB-05 (T. Hisada)
9:40-10:00	**Coffee Break:** Corridor	
	Session VII: Nano-effects in Joining (NEiJ)	**Session VIII: Wire Bonding (WB)**
10:00-10:20	NEiJ-01 (Invited) (J. Janczak-Rusch)	WB-01 (Invited) (F. Niklaus)
10:20-10:40	NEiJ-02 (Y. P. Zhang)	WB-02 (Invited) (M. Maeda)
10:40-11:00	NEiJ-03 (M. Brochu)	WB-03 (M. Mayer)
11:00-11:20	NEiJ-04 (L. Liu)	WB-04 (T. Dagdelen)
11:20-11:40	NEiJ-05 (H. Alarifi)	WB-05 (B. H. Chang)
11:40-13:00	**Lunch**: Restaurant, Jin Chun Yuan Hotel	
	Session IX: Joining of Carbon Materials (JCM)	**Session X: Low Temperature Bonding Using Nanoparticles (LTB)**
13:00-13:20	JCM-01 (Invited) (M. Yavuz)	LTB-01 (Invited) (A. Hirose)
13:20-13:40	JCM-02 (H. Abe)	LTB-02 (Y. H. Mei)
13:40-14:00	JCM-03 (P. He)	LTB-03(H. Nishikawa)
14:00-14:20	JCM-04 (H. W. Zhu)	LTB-04 (L. L. Li)
14:20-14:40	JCM-05 (L. M. Li)	LTB-05 (J. F. Yan)
15:00-17:30	**Tour of the Summer Palace**	
17:30-19:30	**Banquet**: Hall of Listening to Orioles, the Summer Palace	

Technical Program

December 3, 2012 (Monday) 8:00-12:00

Meeting Room 1

Opening Remarks, Chair: Norman Zhou

8:01-8:04 **Luisa Quintino**, Executive Director, European Federation for Welding, Joining and Cutting (EWF), and Board Member, International Institute of Welding (IIW)

8:04-8:07 **Yi Zhang,** Vice Provost for International Affairs, and Director, Office for International Cooperation and Exchange, Tsinghua University

8:07-8:10 **Qiang Chen**, President of the Chinese Welding Society (CWS), Professor of Tsinghua University

Keynote Presentation Session I

Chairs: Akio Hirose, Norman Zhou

8:10-8:50 **Creating Nanojunctions between Carbon Nanotubes, Graphene, and Metals by Focused Electron Beams**

J.-A. Rodríguez-Manzo, O. Cretu and **F. Banhart** (University of Strasbourg, France)

8:50-9:30 **Microwelding in Implantable Medical Devices: Trends, Challenges, and Opportunities**

M. Breyen and M. Reiterer (Medtronic, Inc., USA)

9:30-10:00 **Photo Taking and Coffee Break**

Keynote Presentation Session II

Chairs: Jae Pil Jung, Yasuo Takahashi, Guisheng Zou

10:00-10:40 **3D Packaging Technologies in Mobile Era**

S. Kang (Samsung Electronics Corp., Korea)

10:40-11:20 **MEMS Systems for Microelectronic Packaging Testing**

O. Paul and B. Lemke (University of Freiburg, Germany)

11:20-12:00 **Ultrasonic Nanowelding: from Field-Effect Transistors to Solar Microcells**

Y. F. Zhang[1], B. Zhao[2], C. Liu[1], Y. Z. Zhang[1], W. J. Gu[1], L. Y. Zhang[1], and D. Xu[1] ([1]Shanghai JiaoTong University, China; [2]Jiangsu Normal University, China)

12:00-13:00 **Lunch**

December 3, 2012 (Monday) 13:00-15:00

Meeting Room 1

Session I Laser Nanojoining and Microjoining (LNM)

Chairs: Minlin Zhong, Tomokazu Sano

13:00-13:20 [Invited] **Fundamentals and Applications of Femtosecond Laser Joining and Processing**
W. W. Duley (University of Waterloo, Canada)

13:20-13:40 **Femtosecond Laser Direct Joining of Cu with Polyethylene Terephthalate**
T. Sano, S. Iwasaki, Y. Ozeki, K. Itoh, and A. Hirose (Osaka University, Japan)

13:40-14:00 **Femtosecond Laser Nanowelding for Plasmonic Circuits**
A. Hu and Y. Zhou (University of Waterloo, Canada)

14:00-14:20 **Laser Microjoining of Graphene**
X. H. Ye[1], T. Huang[1], **M. L Zhong**[1], L. Li[2], Z. Lin[1], J. Jiang[1] ([1]Tsinghua University, China; [2]The University of Manchester, UK)

14:20-14:40 **Investigation on Microwelding of Microchip by Laser Soldering**
J. W. Yuan, **J. M. Chen**, F. R. Liu, and C. Huang (Beijing University of Technology, China)

14:40-15:00 **Laser Hole Sealing of CP Titanium for Medical Device Applications**
A. Pequegnat[1], Y. D. Huang[1, 2], M. I. Khan[1], J. C. Feng[2], and Y. Zhou[1] ([1]University of Waterloo, Canada; [2]Harbin Institute of Technology, China)

15:00-15:20 **Coffee Break**

Meeting Room 2

Session II 3D Electronics Packaging (3DEP)

Chairs: Mustafa Yavuz, Yanhong Tian

13:00-13:20	[Invited] **Micro-interconnection Technology for Optoelectronic Devices** **J. H. Zhang** (Shanghai University, China)
13:20-13:40	**High Speed Cu-filling to TSV and non-PR Solder Bumping for Si-chip Stacking** **J. P. Jung**, M. Roh, S. Y. Park and D. H. Jung (University of Seoul, Korea)
13:40-14:00	**Development of Thermal Nano Coating and Micro Patterning Techniques** **S. Kirihara,** Y. Itakura, and S. Tasaki (Osaka University, Japan)
14:00-14:20	**Morphologies of Cu_6Sn_5 in Sn3.0Ag0.5Cu Lead-free Solder Joints on Single Crystal Cu Substrates** **Y. H. Tian**, C.Q.Wang, and L.N. Niu (Harbin Institute of Technology, China)
14:20-14:40	**Microjoining by Means of Self-formation of Melting Solder Bump Patterns in Thermo-setting Resin** **K. Yasuda** (Osaka University, Japan)
14:40-15:00	**Influences of Sputtering Power and Annealing Process on Sb_2Te_3 Film** **C. J. Hang**, C. Q. Wang, M. L. Fu, and S. P. Sun (Harbin Institute of Technology, China)
15:00-15:20	**Coffee Break**

December 3, 2012 (Monday) 15:20-17:00

Meeting Room 1

Session III Medical Microwelding (MM)

Chairs: Rosa Miranda, Anming Hu

15:20-15:40 [Invited] **Review of Microwelding for Medical Device Applications**
M. I. Khan[1], A. Pequegnat[2], and Y. Zhou[2] ([1]Smarter Alloys, Canada; [2]University of Waterloo, Canada)

15:40-16:00 **Porosity Formation Mechanism in Laser Microwelding of Pt-10%Ir to 316LVM Stainless Steel**
Y. D. Huang[1,2], G. S. Zou[2,3],A. Pequegnat[3], and Y. Zhou[2, 3] ([1] Nanchang Hangkong Universtiy, China; [2]Tsinghua University, China; [3] University of Waterloo, Canada)

16:00-16:20 **Dissimilar Laser Welding of Shape Memory Alloys**
R. Miranda[1] and L. Quintino[2] ([1]Universidade Nova de Lisboa, Portugal; [2]Instituto Superior Técnico, Portugal)

16:20-16:40 **Microstructure of the Micro Laser Welded Joint of Ultrathin TiNi Shape memory Alloy**
Y. H. Chen, Y. D. Huang, and L. M. Ke (Nanchang Hangkong University, China)

16:40-17:00 **Latent Cracking of Tantalum - Titanium Welds due to Hydrogen Embrittlement Observed on Electrical Interconnects**
M. Reiterer, J. Heffenfinger, M. Hintz, M. Ringle, J. Hossick-Schott, and K. Gaffney (Medtronic, Inc., USA)

17:00-18:00 **Poster Session (P):** Meeting Room 1 and Corrider

18:00-19:00 **Dinner**

Meeting Room 2

Session IV Micro-device Packaging (MDP)

Chairs: Mingyu Li, Hiroaki Mori

15:20-15:40 [Invited] **Femtosecond Laser Welding for Micro-device Integration**
L. Liu[1], **L. Quintino**[2], G. Zou[3], A. Hu[1], and Y. Zhou[1,3] ([1]University of Waterloo, Canada; [2]Instituto Superior Técnico, Portugal; [3]Tsinghua University, China)

15:40-16:00 **Microstructure of Nano-sized Ag-Cu/AlN Multilayers for Low-Temperature Joining Applications**
G. Pigozzi[1], A. Antušek[1,2], J. Janczak-Rusch[1], M. Parlinska-Wojtan[1,3], D. Passerone[1], C. A. Pignedoli[1], V. Bissig[4], J. Patscheider[1], and **L. P. H. Jeurgens**[1] ([1]Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland； [2]Slovak University of Technology in Bratislava, Slovak Republic； [3]University of Rzeszow, Poland; [4]Kirsten Soldering AG, Switzerland)

16:00-16:20 **Radial Anisotropic Growth of Cu_6Sn_5 Crystals in Sn/Cu Couples**
Z. H. Zhang, **M. Y. Li**, and C. Q. Wang (Harbin Institute of Technology, China)

16:20-16:40 **Effect of Substrate on Formation of Kirkendall Voids**
C. Yu, Y. Yang and H. Lu (Shanghai Jiao Tong University, China)

16:40-17:00 **Head-in-Pillow BGA Solder Defect**
X. J. Wang[1,2], Q. Chen[2], and H. Q. Xu[2] ([1]Jiangsu University of Science & Technology, China; [2]Uunow Electronical Material Company Co. Ltd, China)

17:00-18:00 **Poster Session (P): Meeting Room 1 and Corrider**

18:00-19:00 **Dinner**

December 3, 2012 (Tuesday) 17:00-18:00

Poster Session (P)

Meeting Room 1 and Corrider

1. **Bonding of Cu Bulks through the Low Temperature Sintering of Ag Nanoparticles in-situ Formed using Micro-Ag_2O Composite Paste**
   F. W. Mu [1], Z. Y. Zhao[1], G. S. Zou[1], J. F. Yan[1], H. L. Bai[1], A. P. Wu[1], Z. G. Sun[1], J. C. Yan[2], L. Liu[3], Y. Norman Zhou[1, 3] ([1]Tsinghua University, China; [2]Harbin Institute of Technology, China; [3]University of Waterloo, Canada)

2. **Effect of the Substrate Modes on the Nanojoining of Graphene under Ultrafast Laser Beam Irradiation**
   X. Wu[1], H. Y. Zhao[1], M. L. Zhong[1], H. Murakawa[2], and M. Tsukamoto[2] ([1]Tsinghua University, China; [2]Osaka University, Japan)

3. **Numerical Simulation of Micro Bubble Behavior in Molten Metal of Aluminum Alloy**
   Q. F. Zhou[1], H. Mori[1], and A. Sugiyama[2] (Osaka University, Japan; [2]Osaka Sangyo University, Japan)

4. **Evolution of Interfacial Shear Force during Ultrasonic Ribbon Bonding**
   M. Ando, M. Maeda, and Y. Takahashi (Osaka University, Japan)

5. **Pressureless Low Temperature Sintering of Ag Nanoparticles for Interconnects**
   S. Wang, H. J. Ji, M. Y. Li, and C. Q. Wang (Harbin Institute of Technology, China)

6. **Effect of Argon Ion Irradiation on Ohmic Contact Formation on n-type Gallium Nitride**
   K. Kimura, M. Maeda and Y. Takahashi (Osaka University, Japan)

7. **Interfacial Microstructure in Aluminum and Nickel Bonding Using Silver Nanoparticles Derived from Silver Oxide**
   S. Takata, T. Ogura, and A. Hirose (Osaka University, Japan)

8. **Multi-walled Carbon Nano Tubes Junction by Fiber Laser Exposure**
   Q. S. Su, J. M. Chen and F. R. Liu (Beijing University of Technology, China)

9. **Low Energy Resistance Spot Welding Using Silver Nanoparticle**
   Y. Suzuki, T. Ogura, and A. Hirose (Osaka University, Japan)

10. **Micro-arc Welding of Nanostructured Al-Si alloy**
    J. Milligan, R. Gauvin and M. Brochu (McGill University, Canada)

11. **Solute Distribution in Aluminum-Lithium Micro-weldments**
    D. W. Heard[1], J. Boselli[2], R. Gauvin[1], and M. Brochu[1] ([1]McGill University, Canada; [2]ALCOA Technical Center, USA)

12. **Weld Interface Formation in Resistance Microwelding of Platinum Alloy to Nickel**
    T. Hiraki[1], S. Fukumoto[1], M. Matsushima[1], K. Sakairi[2], Y. Nomura[2], K. Tanaka[2], and K. Fujimoto[1] ([1]Osaka University, [2]Tanaka Precious Metals, Japan)

13. **Characteristics of Environment-Friendly Ni Paste for Stainless Steel Brazing**
    M. H. Roh[1], S. Y. Park[1], J. H. Lee[2], J. H. Park[3], J. H. Oh[3], W. Kim[1], and **J. P. Jung**[1]([1]University of Seoul, Korea; [2]Korea Institute of Industrial Technology, Korea; [3]Chem-tech Korea Co., Korea)

14. **Effects of Welding on NiTi Shape Memory Alloy Functional Properties**
    A. Pequegnat and Y. Zhou (University of Waterloo, Canada)

15. **High Temperature Service Property Evaluation of Sintered Cu-Cu Joints Using Ag Nanoparticle Paste**
    L. C. Lin[1], J. F. Yan[1], G. S. Zou[1], H. L. Bai[1], D. Y. Zhang[1], A. P. Wu[1], Z. G. Sun[1], L. Liu[3] and Y. Norman Zhou[1,2] ([1]Tsinghua University, China; [2]University of Waterloo, Canada)

16. **Low Temperature Sintering-Bonding Using Mixed Cu+Ag Nanoparticle Paste for Packaging Application**
    Y. C. Zhang[1], J. F. Yan[1], G. S. Zou[1], L. C. Lin[1], D. Y. Zhang[1], A .P. Wu[1], Z. G. Sun[1], L. Liu[2] and Y. Zhou[1,2] ([1]Tsinghua University, China; [2]University of Waterloo, Canada)

17. **The Effects of Ag-coated Cu Particles Added into Micro-Ag_2O Paste on the Sintered Joint Performance**
    F. W. Mu[1], Z. Y. Zhao[1], G. S. Zou[1], F. Yan[1], H. L. Bai[1], A. P. Wu[1], Z. G. Sun[1], J. C. Yan[2], L. Liu[3], and Y. Zhou[1, 3] ([1]Tsinghua University, China; [2]Harbin Institute of Technology, China; [3]University of Waterloo, Canada)

December 4, 2012 (Tuesday) 8:00-10:00

Meeting Room 1

Session V Nanowelding (NW)

Chairs: Tong Zhang, Tomo Ogura

8:00-8:20 [Invited] **Nanowelding Processes by Solder and Friction**
B. J. Inkson[1], K. Briston[1], K. Chatzimanolis[1], A. J. Lockwood[1], K Anantheshwara[2], M. S. Bobji[2] and Y. Peng[3] ([1]University of Sheffield, UK; [2]Indian Institute of Science (IISc), India; [3]Lanzhou University, China)

8:20-8:40 **Bondability of Joints Using Ag_2O and CuO Combined Paste for Electronics Packaging**
T. Ogura, T. Yagishita, S. Takata, T. Fujimoto, and A. Hirose (Osaka University, Japan)

8:40-9:00 **Molecular Dynamics Simulation on Graphene Joining in Nano Scale**
H. Y. Zhao[1], X. Wu[1], M. L. Zhong[1], H. Murakawa[2], and M. Tsukamoto[2] ([1]Tsinghua University, China; [2]Osaka University, Japan)

9:00-9:20 **Synthesis and Characterization of Linked Plasmonic Nanostructures**
T. Zhang, X. Y. Zhang, L. D. Wang, Y. J. Song, M. N. Lin, L. N. Wang, S. Q. Zhu, and R. Z. Li (Southeast University, China)

9:20-9:40 **A Study of Sintering Bonding Using Silver Nanowires Paste**
W. Guo[1], S. P. Tang[1], Y. Zhu[1], J. F. Yan[2], G. S Zou[2], Y. Norman Zhou[2,3]([1]Beihang University, China; [2]Tsinghua University, China; [3]University of Waterloo, Canada)

9:40-10:00 **Coffee Break**

Meeting Room 2

Session VI Flip-chip Bonding (FCB)

Chairs: Chunqin Wang, Shinji Fukumoto

8:00-8:20 [Invited] **Recent Development of Room Temperature Bonding using the Surface Activation Method**
T. Suga (University of Tokyo, Japan)

8:20-8:40 **Stencil Printing for Fine Pitch BGA Ball Attachment**
Z. Y. Liu, **J. Cai**, Q. Wang and X. He (Tsinghua University, China)

8:40-9:00 **Reliability of Pb-free BGA Solder Joints under Random Vibration**
F. J. Wang, D. Y. Tang, H. B. Wen and M. F. Wu (Jiangsu University of Science & Technology, China)

9:00-9:20 **Surface Mounting Process Using Hybrid Resin Sheet Including Self-organizable Solder Particles**
S. Fukumoto, S. Inoue, R. Wakimoto, Y. Yamamoto, M. Matsushima, and K. Fujimoto (Osaka University, Japan)

9:20-9:40 **Effect of Low Temperature Flip Chip Joining on Chip-package-interaction of Low-k Device**
T. Hisada, K. Toriyama, Y. Yamada, and T. Aoki (IBM Japan Ltd., Japan)

9:40-10:00 **Coffee Break**

December 4, 2012 (Tuesday) 10:00-11:40

Meeting Room 1

Session VII Nano-effects in Joining (NEiJ)

Chairs: Mathieu Brochu, Baohua Chang

10:00-10:20	[Invited] **Melting Point Depression of Nanostructured Filler Metals for Brazing Applications** **J. Janczak-Rusch** (Swiss Federal Laboratories for Materials Science and Technology, Switzerland)
10:20-10:40	**Ni Rich Al-Ni Nano Multilayers for Cu-Cu Micro Joining** **Y. P. Zhang[1],** Y. Q. Yang[1, 2], J. L. Yi[1], and H. C. Hu[1] ([1]E. O. Paton Chinese-Ukrainian Institute of Welding, China; [2] South China University of Technology, China)
10:40-11:00	**Controlling Solidification Grain Size in Electrospark Deposition by Alloy Engineering** **M. Brochu** and J. G. Portillo (McGill University, Canada)
11:00-11:20	**Heat Generation in Ag Nanowires Induced by Femtosecond Laser Irradiation** **L. Liu** [1], G. Zou[2], A. Hu[1], W. W. Duely[2], and Y. Zhou[1, 2] ([1]University of Waterloo, Canada; [2]Tsinghua University, China)
11:20-11:40	**Ag Nanoparticles and their Application in Low-Temperature Bonding of Cu** **H. Alarifi**[1], M. Atis[2], C. Özdoğan[3], A. Hu[1], M. Yavuz[1], and Y. Zhou[1] ([1]University of Waterloo, Canada; [2]Nevsehir University, Turkey; [3]Çankaya University, Turkey)
11:40-13:00	**Lunch**

Meeting Room 2

Session VIII Wire Bonding (WB)

Chairs: Jian Cai, Michael Mayer

10:00-10:20 [Invited] **Unconventional Approaches in Wire Bonding**
F. Niklaus[1], A. C.Fischer[1], and J. Korvink[2] ([1]KTH Royal Institute of Technology, Sweden; [2] University of Freiburg, Germany)

10:20-10:40 [Invited] **Ultrasonic Bonding for Assembly of Power Electronics**
M. Maeda and Y. Takahashi (Osaka University, Japan)

10:40-11:00 **Ultrasonic Stresses in Copper Wire Bonding with Pre-Bleed Ultrasound**
M. Mayer (University of Waterloo, Canada)

11:00-11:20 **Fatigue Analysis of Thick Wire Bonds**
T. Dagdelen[1], K. El-Rayes[1], M. Khater[1], E.Abdel-Rahman[1], I. Sel[2] and M. Yavuz[1] ([1]University of Waterloo, Canada; [2]Orhan Gazi University, Turkey)

11:20-11:40 **An Incrementally Coupled Numerical Model for Copper Wire Thermosonic Bonding Process**
B. H. Chang[1], X. Y. Bai[1], W. Jiang[1], H. Huang[1], D. Du[1], M. Mayer[2], and Y. Zhou[2] ([1]Tsinghua University, China; [2]University of Waterloo, Canada)

11:40-13:00 **Lunch**

December 4, 2012 (Tuesday) 13:00-14:40

Meeting Room 1

Session IX Joining of Carbon Materials (JCM)

Chairs: Peng He, Hiroya Abe

13:00-13:20 [Invited] **Joining of Carbon-Nano-Tubes by Vacuum Brazing and their Structural Evaluation**
M. Yavuz[1], W. Wu[1], A. Hu[1], X. Li[2], J. Q. Wei[2], Q. Shu[2], K. L. Wang[2], I. Sel[3] and Y. Zhou[1] (University of Waterloo, Canada; [2]Tsinghua University, China; [3]Orhan Gazi University, Turkey)

13:20-13:40 **Direct Transferring Aligned CNTs Patterns Using CNT Biological Gels**
H. Abe, Z. Tan, A. Kondo, and M. Naito (Osaka University, Japan)

13:40-14:00 **A Molecular Dynamics Model of Joining a SWCNT with a Gold Nano Particle**
P. He, T. S. Lin, and D. Xu (Harbin Institute of Technology, China)

14:00-14:20 **Joining of Graphene Domains**
L. L. Fan, X. L. Fan, K. L. Wang, and **H. W. Zhu** (Tsinghua University, China)

14:20-14:40 **Joining of Carbon Nanotube Yarns and Stainless Steel via Crimping**
F. Xu and **L. M. Li** (Tsinghua University, China)

15:00-17:30 **Tour of the Summer Palace**

17:30-19:30 **Banquet**

Meeting Room 2

Session X Low Temperature Bonding Using Nanoparticles (LTB)

Chairs: Hiroshi Nishikawa, Chunjin Hang

13:00-13:20 [Invited] **Joining Technology through Sintering of Nano Scale Particles**
A. Hirose (Osaka University, Japan)

13:20-13:40 **Transient Thermal Performance of Low-Temperature Sintered Nanosilver Joints**
G. Chen[1], Y. J. Cao[1], **Y. H. Mei**[1], T. Wang[1], X. Cao[2], G. Q. Lu[2], X. Chen[1] ([1]Tianjin University, China; [2]Virginia Polytechnic Institution and State University, USA)

13:40-14:00 **Improvement of Joint Strength of Cu/Cu Joint Using Cu Nanoparticle Paste**
H. Nishikawa[1], L. Wei[1], and N. Terada[2] ([1]Osaka University, Japan; [2]Harima Chemicals, Inc., Japan)

14:00-14:20 **Thermal Interface Materials Using Silver Nanoparticles for High Power Electronics**
L. L. Li and H. Yu (Tsinghua University, China)

14:20-14:40 **Metal–Metal Bonding Process Using Polyol Prepared Silver Nanoparticles**
J. F. Yan[1], G. S. Zou[1], A. P. Wu[1], Y. C. Zhang[1], L. C. Lin[1], J. X.Li[1], H. L. Bai[1], Z. G. Sun[1], J. C. Yan[2], A. Hu[3], L. Liu[3] and Y. Zhou[1,3] ([1]Tsinghua University, China; [2]Harbin Institute of Technology, China; [3]University of Waterloo, Canada)

15:00-17:30 **Tour of the Summer Palace**

17:30-19:30 **Banquet**

Oral Presentation Guide

1) A laptop computer with Windows XP & PowerPoint 2007 is equipped in each room. A USB memory is available for installation of your PowerPoint file to the laptop computer. PowerPoint 2010 file will be NOT acceptable.
2) Generally speaking, you are suggested to use the mentioned laptop computer for saving time. If you have to use your own laptop computer for your presentation, the projector has only a usual analog mini D-sub 15 pin connector. Please bring an adapter for interface conversion, if necessary.
3) You are requested to confirm if your presentation slides are properly projected on a screen before the session.
4) The keynote lecture time is 40min including 5min discussion. The invited or regular lecture time is 20min consisting of 15min for presentation and 5min for discussion.

Author's Guide to Prepare Posters

1) **Language:** Poster must be prepared in English.
2) **Poster size:** A_0 size (W841 mm× H1189 mm).
3) **Presentation:** One at least of the authors should stand in front of your poster board during the poster session time of 17:00-18:00 PM, Dec.3, to present your paper to attendees. Presentation must be done in English.
4) Enclosed is the poster template. It is very important to ensure that your poster follows the style guide presented in this template so as to provide a uniform and consistent appearance.
5) Please send your finished poster before November 18 (Sunday) at **nmj2012@tsinghua.edu.cn** both with a PPT/PPTX format and a JPG format. The poster file name is suggested as PT-correspondence author name-NMJ 2012.
6) **Tips:** The printing, pinning and collecting of the posters will all be performed by the NMJ 2012 Secretariat.

Social Events

1. Tour of the Summer Palace

On December 4th (Tuesday), before the banquet held in the Hall of Listening to Orioles, there will be an about 2-hour tour of the Summer Palace. The cost will be borne by the conference.

Schedule

15:00	Leave at the front door of the Jin Chun Yuan Hotel for the Summer Palace
15:30-17:30	Tour of the Summer Palace
17:30-19:30	Traditional Chinese Art Performance and Banquet

The Summer Palace

Centered on the Tower of Buddhist Incense, the Summer Palace is a monument of traditional Chinese architecture, in terms of both garden design and construction. Borrowing scenes from surrounding landscapes, it radiates not only the grandeur of an imperial garden but also the beauty of nature in a seamless combination that best illustrates the guiding principle of traditional Chinese garden design: “The works of men should match the works of Heaven”. It was first built in 1153 and served as an imperial palace for short stay away from the capital.

2. Trip to the Great Wall and the Ming Tombs

The view trip to the Great Wall and the Ming Tombs on December 5 (Wednesday) will be organized by the conference, and attendees are requested to pay $100 upon the registration.

Schedule

8:00	Pick up from the Jin Chun Yuan Hotel by the tour guide
8:00-9:30	Driving to the Great Wall
9:30-11.30	Tour of the Badaling Great Wall (Cable car included)
11:30-13.00	Visit to the Cloisonne Factory and lunch at the Jindian International Friendship Restaurant
13:00-14.30	Tour of the Underground Palace (Ming Tombs)
14:30-15.00	Return to the Jin Chun Yuan Hotel

Note: The schedule is subject to modification depending on the weather and transport. If there are unforeseen factors such as great snow and a heavy rain and so on which impedes the view trip to the Great Wall and the Ming Tombs, the view trip will be changed to the tour in the city of Beijing including visits to the Forbidden City and the Temple of Heaven. The details are as below in the "**3. Tour in the city of Beijing for the accompanying persons"** and the tour fee is also $100.

The Great Wall

The Great Wall, one of the greatest wonders of the world, built originally to protect the northern borders of the Chinese Empire against intrusions by various nomadic groups, was enlisted in the World Heritage by UNESCO in 1987. Just like a gigantic dragon, the Great Wall winds up and down across deserts, grasslands, mountains and plateaus, stretching approximately 6,700 kilometers (4,163 miles) from east to west of China.

The Ming Tombs

At a distance of 50 km northwest of Beijing stands an arc-shaped cluster of hills fronted by a small plain. Known as the Ming Tombs, here is where 13 emperors of the Ming dynasty (1368-1644) were buried. During the Ming Dynasty, established by Han Chinese coming from an agricultural society in central China, people believed the existence of an after-world, where the dead "lived" a life similar to that of the living. Ming emperors, therefore, had grand mausoleums built for themselves.

3. Tour in the city of Beijing for the accompanying persons

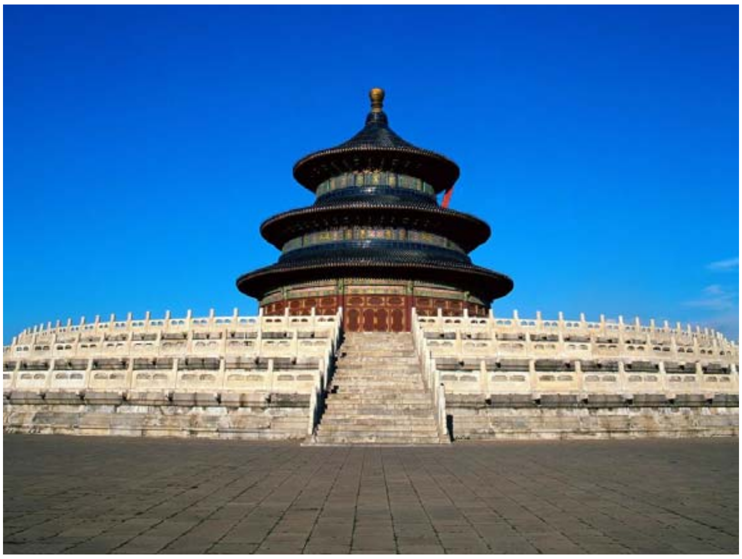
A 2-day tour to the Forbidden City and the Temple of Heaven during December 3-4 will be organized for the accompanying persons **only exceeding 4 in number** at their own expenses ($150). Attendees are requested to contact the conference secretariat **by November 28.**

The Forbidden City

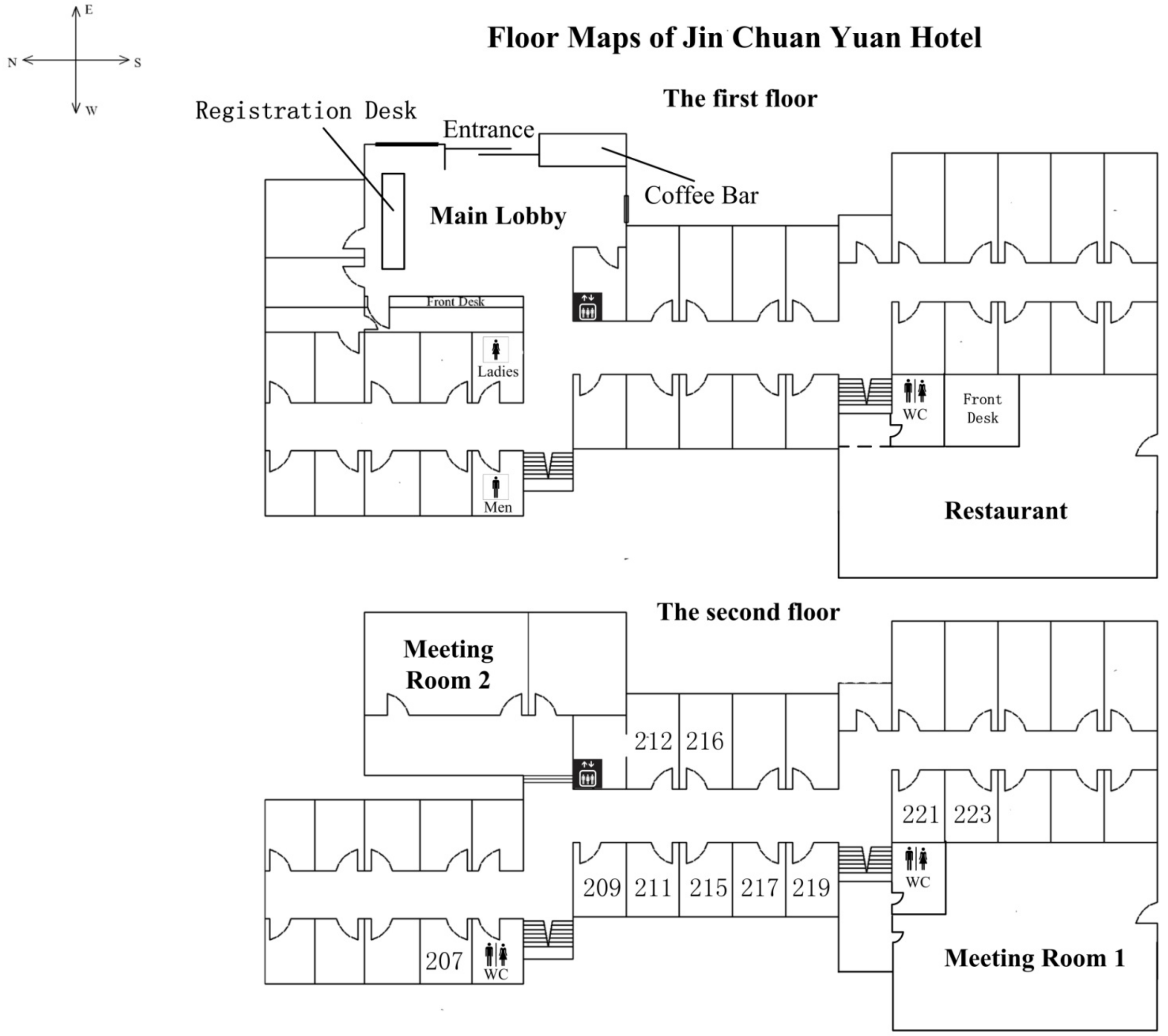
The Forbidden City was the Chinese imperial palace from the Ming Dynasty to the end of the Qing Dynasty. It is located in the middle of Beijing and now houses the Palace Museum. For almost 500 years, it served as the home of emperors and their households, as well as the ceremonial and political center of Chinese government.

The Temple of Heaven

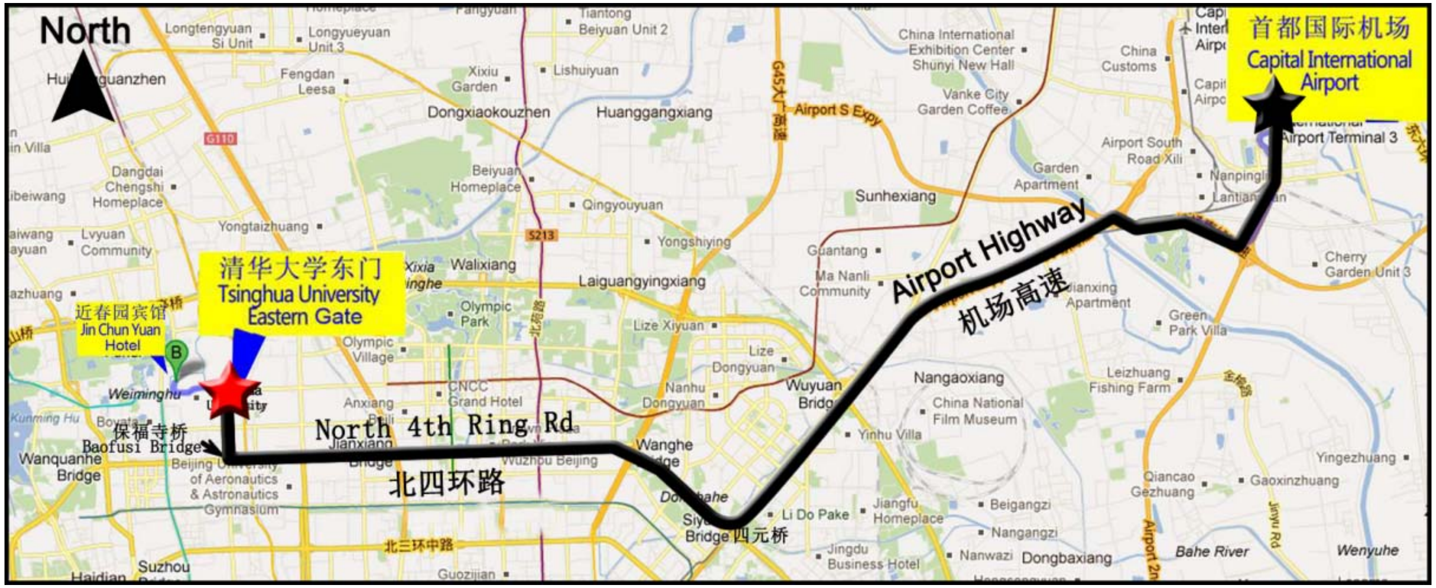
The Temple of Heaven, literally the Altar of Heaven is a complex of religious buildings situated in the southeastern part of central Beijing. The complex was visited by the Emperors of the Ming and Qing dynasties for annual ceremonies of prayer to Heaven for good harvest.



Floor Maps of Jin Chuan Yuan Hotel



Transportation Guide for Overseas Attendees



You can take a taxi from the Capital International Airport to the Jin Chun Yuan Hotel in Tsinghua University, which will need about 60 minutes with a cost of about 100 RMB. It is better to tell the taxi driver go to Tsinghua University Eastern Gate (清华大学东门) first. After arrival in Tsinghua University campus, you can ask about the position of Jin Chun Yuan Hotel (清华大学近春园宾馆). If you need a pick up from the Beijing Capital International Airport, the flight information in details and names of persons who will travel together with you are needed to be provided to NMJ 2012 Secretariat.

Jin Chun Yuan Hotel
Tsinghua University
Qinghua Yuan No.1
Haidian District
Beijing, 100084
P.R.China
Tel: +86-10-62784008
Fax: +86-10-62770242

NMJ 2012 Conference Contact:
Secretary: Prof. Zhenguo SUN at +86-13910003348
Secretary: Ph. D student Dongyue ZHANG at +86-15810950256
Secretary General: Prof. Guisheng ZOU at +86-13501246859

Tsinghua Campus Sketch Map