

General Information

All the breakfasts, coffee breaks and lunches will be provided by the conference. The welcome reception will be on Monday evening and the banquet will be on Thursday evening. Participants will be on their own for dinner on other evenings.

There will be tours to TRIUMF, the UBC Farm and the UBC Botanical Gardens. Since TRIUMF will not be able to accommodate the entire group on one day, half of the group will visit TRIUMF and the Farm on Tuesday, while the other half will visit the Botanical Gardens. On Thursday, the groups will switch. Please make sure to familiarize yourself with these venues and the relevant safety requirements through the links given on the conference website, and inform us if you have any question or concern.

Conference Venue: Earth Sciences Building (ESB), 2207 Main Mall (on the UBC campus)

Oral sessions: ESB 1013

Poster sessions: ESB 1013 for the rapid fire presentations and ESB lobby for the posters

Breakfasts, coffee breaks and lunches: ESB lobby

Reception on Monday: Ponderosa East Ballroom (on the UBC campus)

Banquet on Thursday: Sage Bistro, 6331 Crescent Road (on the UBC campus)

08:00-10:00 Registration

10:00-10:30 Breakfast and welcome address

10:30-12:00 Tutorial 1: theory and modeling of field-electron emitters

- 10:30 Tutorial T1.1 (35+10 min): Field electron emission theory for metals and semiconductors

R. G. Forbes
University of Surrey, UK

- 11:15 Tutorial T1.2 (35+10 min): Atomic-level modeling of cold field electron emission, using carbon as an example

Z. Li
Sun Yat-sen University, China

12:00-14:00 Lunch and networking

14:00-15:30 Tutorial 2: theory and modeling of photo-electron emitters

- 14:00 Tutorial T2.1 (35+10 min): An introduction to photoemission: theory and modeling

K. L. Jensen
Naval Research Laboratory, USA

- 14:45 Tutorial T2.2 (35+10 min): Photoemission of electrons from sharp needle tips driven by femtosecond laser pulses: a tutorial

P. Hommelhoff
Friedrich-Alexander University Erlangen-Nuremberg, Germany

15:30-16:00 Coffee break

16:00-17:30 Tutorial 3: theory and modeling of thermal electron emitters

- 16:00 Tutorial T3.1 (35+10 min): Thermionic emission theory: a tutorial

T. R. Groves
University at Albany, State University of New York, USA

- 16:45 Tutorial T3.2 (35+10 min): Thermionic emission for novel materials and its thermal relevance on other emission mechanisms

L. K. Ang
Singapore University of Technology and Design, Singapore

17:30-18:00 Free time

18:00-19:30 Welcome reception

08:00-08:30 Breakfast and registration

08:30-10:15 Photo-emission 1: ultra-fast emitters

- 08:30 Plenary PE1.P1 (35+10 min): Harnessing photoionization or photo-recombination to create attosecond science and technology

*P. B. Corkum
University of Ottawa and National Research Council, Canada*

- 09:15 PE1.C1 (15+5 min): An exact formulation for ultrafast electron emission due to a DC bias and a laser field

*P. Zhang, Y. Y. Lau
University of Michigan, USA*

- 09:35 PE1.C2 (15+5 min): Electron emission from nanostructures triggered by optical and terahertz ultrafast pulses

*M. Monshipouri, Y. Abdi, Y. Oh, S. Bagiante, V. Guzenko, S. Tsujino, F. Brunner, T. Feurer
University of Tehran, Iran; Paul Scherrer Institute, Switzerland; University of Bern, Switzerland*

- 09:55 PE1.C3 (15+5 min): Field emission from gated silicon field emitter array induced by sub-nanosecond laser pulses

*H. Shimawaki, Y. Neo, H. Mimura, M. Nagao, F. Wakaya, M. Takai
Hachinohe Institute of Technology, Japan; Shizuoka University, Japan; National Institute of Advanced Industrial Science and Technology, Japan;
Osaka University, Japan*

10:15-10:30 Coffee break

10:30-11:50 Photo-emission 2: properties and applications

- 10:30 PE2.C1 (15+5 min): Photo-enhanced field emission properties of p-doped black Si arrays

*S. Mingels, V. Porshyn, P. Serbun, D. Lützenkirchen-Hecht, G. Müller, C. Prommesberger, C. Langer, R. Schreiner
University of Wuppertal, Germany; OTH Regensburg, Germany*

- 10:50 PE2.C2 (15+5 min): Delayed photo-emission model for PIC codes

*K. L. Jensen, J. J. Petillo, D. Panagos, S. Ovtchinnikov, N. A. Moody
Naval Research Laboratory, USA; Leidos Corp., USA; Gnosys, Inc., USA; Los Alamos National Laboratory, USA*

- 11:10 PE2.C3 (15+5 min): A bright and durable field-emission source derived from frozen refractory-metal Taylor cones

*G. Hirsch
Hirsch Scientific, USA*

- 11:30 PE2.C4 (15+5 min): Radiation tolerance of compact image sensor with field emitter array and cadmium telluride-based photoconductor

*Y. Gotoh, H. Tsuji, M. Nagao, T. Masuzawa, Y. Neo, H. Mimura, T. Okamoto, M. Akiyoshi, N. Sato, I. Takagi
Kyoto University, Japan; National Institute of Advanced Industrial Science and Technology, Japan; Shizuoka University, Japan; National
Institute of Technology, Japan; Osaka Prefecture University, Japan*

11:50-16:30 Lunch and tour 1

16:30-18:00 Rapid fire posters overview and poster session 1

08:00-08:30 Breakfast and registration**08:30-10:15 Field-emission 1: vacuum nanoelectronic devices**

- 08:30 Plenary FE1.P1 (35+10 min): Nanoscale vacuum electronic devices
M. Meyyappan
NASA Ames Research Center, USA
- 09:15 FE1.C1 (15+5 min): The enhancement of the electron field emission behavior of diamond/CNTs materials via the plasma post-treatment process for the applications in triode-type vacuum field emission transistor
D. Manoharan, H.-T. Chang, I.-N. Lin, T.-H. Chang, P.-Y. Hsieh, S. Kunuku, K.-C. Leou, C.-Y. Lee, N.-H. Tai,
Tamkang University, Taiwan; NTHU, Taiwan
- 09:35 FE1.C2 (15+5 min): Graphene-based micro-emitters and vacuum transistors
G. Wu, X. Wei
Peking University, China
- 09:55 FE1.C3 (15+5 min): Planar graphene vacuum transistor performance potential
J. L. Shaw, J. G. Champlain, B.-D. Kong, K. L. Jensen, J. B. Boos
Naval Research Laboratory, USA

10:15-10:30 Coffee break**10:30-12:00 Field-emission 2: novel nanoscale emitters**

- 10:30 Invited FE2.I1 (20+10 min): Application of ultra-high-brightness nano-emitter for electron microscopes
H. Zhang, J. Tang, Y. Yamauchi, L.-C. Qin
National Institute for Materials Science, Japan; University of North Carolina Chapel Hill, USA
- 11:00 FE2.C1 (15+5 min): Fabrication of transparent gated ZnO nanowire field emitter arrays
G. Zhang, Z. Zhang, L. Zhao, J. She, S. Deng, N. Xu, J. Chen
Sun Yat-sen University, China
- 11:20 FE2.C2 (15+5 min): Field electron emission of boron nitride nanotube emitters
K. N. Yun, G. Leti, J. S. Han, C. J. Lee, Y.-H. Song
Korea University, Korea; ETRI, Korea
- 11:40 FE2.C3 (15+5 min): Single SnO₂ nanowire: field emission investigations
P. D. Joshi, D. S. Joag, I. S. Mulla, D. J. Late
Savitribai Phule Pune University, India; Centre for Materials for Electronics Technology, India; CSIR-National Chemical Laboratory, India

12:00-14:00 Rapid fire posters overview, lunch and poster session 2**14:00-15:30 Field-emission 3: nano-carbon emitters**

- 14:00 Invited FE3.I1 (20+10 min): Circular gated carbon nanotube field emitters with ballasted resistance
J. T. W. Yeow
University of Waterloo, Canada
- 14:30 FE3.C1 (15+5 min): A platform to optimize the field emission properties of carbon-nanotube-based fibers
M. Cahay, W. Zhu, K. L. Jensen, R. G. Forbes, S. B. Fairchild, T. C. Back, G. Gruen, T. Murray, J. R. Harris, D. A. Shiffler
University of Cincinnati, USA; Naval Research Laboratory, USA; University of Surrey, UK; Air Force Research Laboratory, USA; University of Dayton, USA
- 14:50 FE3.C2 (15+5 min): Unprecedented current modulation with in-plane gated field emitters
L. Sabaut, P. Ponard, J.-P. Mazellier, P. Legagneux
Thales Electron Devices, France; Thales Research and Technology, France
- 15:10 FE3.C3 (15+5 min): In situ field emission measurement and field emission enhancement of few-layer graphene decorated with Au nanoparticles
J. Xu, Q. Wang, Z. Qi, Y. Zhai, X. Zhang
Southeast University, China

15:30-16:00 Coffee break**16:00-17:30 Field-emission 4: non-vacuum devices and vacuum generation**

- 16:00 Invited FE4.I1 (20+10 min): On the role of field emission in atmospheric-pressure microscale plasmas
D. B. Go
University of Notre Dame, USA
- 16:30 FE4.C1 (15+5 min): Ultra-low turn-on field emission devices characterized at atmospheric pressures and high temperatures
W. M. Jones, D. Lukin, A. Scherer
California Institute of Technology, USA
- 16:50 FE4.C2 (15+5 min): He channel nanotransistors – Towards “vacuum-less” empty state electronics
S. A. Guerrero, A. I. Akinwande
Creative Microsystems, Inc., USA; Massachusetts Institute of Technology, USA
- 17:10 FE4.C3 (15+5 min): Improved ionization efficiency in MEMS-type ion-sorption micropump
T. Grzebyk, A. Górecka-Drzazga, J. A. Dziuban
Wroclaw University of Science and Technology, Poland

08:00-08:30 Breakfast and registration

08:30-10:25 Thermal emission and energy conversion

- 08:30 Plenary TEC.P1 (35+10 min): Thermoelectronic energy conversion - A large-scale nano-application?
J. Mannhart, R. Wanke, I. Rastegar, W. Voesch, W. Braun
Max Planck Institute for Solid State Research, Germany
- 09:15 Invited TEC.I1 (20+10 min): Wafer-scale thermionic energy converters
R. T. Howe
Stanford University, USA
- 09:45 TEC.C1 (15+5 min): The state and potential of diamond in efficient direct energy conversion
F. A. Koeck, R. J. Nemanich
Arizona State University, USA
- 10:05 TEC.C2 (15+5 min): Towards compact solar thermionic converters based on carbon nanotubes forests
K. Dridi, A. H. Khoshaman, A. Nojeh, G. A. Sawatzky
University of British Columbia, Canada

10:25-10:30 Coffee break

10:30-12:00 Materials and devices 1: fabrication and characterization

- 10:30 Invited MD1.I1 (20+10 min): The applications of super-aligned carbon nanotubes in vacuum electronics
P. Liu, Y. Wei, L. Liu, S. Fan, K. Jiang
Tsinghua University, China
- 11:00 MD1.C1 (15+5 min): Vertically aligned carbon nanotubes (VACNTs) size shrinking through catalyst size reduction: use of innovative nanodiamonds hard mask technique
J.-P. Mazellier, J. Delchevalrie, L. Sabaut, H. Girard, S. Saada
Thales Research and Technology, France; Thales Electron Devices, France; CEA-LIST LCD, France
- 11:20 MD1.C2 (15+5 min): Self-aligned double patterning for vacuum electronic device fabrication
A. T. Koch, A. R. Lingley, M. N. Mankin, T. S. Pan
Modern Electron, USA
- 11:40 MD1.C3 (15+5 min): Electron emission properties of graphene-oxide-semiconductor planar-type electron emission devices
K. Murakami, M. Nagao, S. Tanaka, T. Iijima, J. Fujita, Y. Nemoto, M. Takeguchi
AIST, Japan; University of Tsukuba, Japan; NIMS, Japan

12:00-16:30 Lunch and tour 2

16:30-17:30 Free time

17:30-18:00 Group photo

18:00-21:00 Banquet

FRIDAY, 15 JULY 2016

08:00-08:30 Breakfast and registration**08:30-10:25 Materials and devices 2: microscopy**

- 08:30 Plenary MD2.P1 (35+10 min): With new electron optical concepts towards the most advanced electron microscopes
M. Haider
CEOS GmbH, Germany; Karlsruhe Institute of Technology, Germany
- 09:15 Invited MD2.I1 (20+10 min): Using ultra-bright electron sources to analyze matter atom-by-atom
O. L. Krivanek, N. J. Bacon, N. Dellby, T. C. Lovejoy
Nion Co., USA; Arizona State University, USA
- 09:45 MD2.C1 (15+5 min): Development of small sized FE-SEM equipped with a carbon nanotube field emitter
Y. Saito, S. Oishi, S. Yamazaki, H. Nakahara, H. Murata, T. Ohno
Nagoya University, Japan; Meijo University, Japan; Technex Lab Co., Japan
- 10:05 MD2.C2 (15+5 min): Field emission microscopy study of freestanding carbon nanotube array
Y. Sun, Y. Li, J. T.W. Yeow
University of Waterloo, Canada

10:25-10:40 Coffee break**10:40-12:20 Materials and devices 3: microscopy**

- 10:40 Invited MD3.I1 (20+10 min): The current state-of-the-art in electron imaging and spectroscopy of materials
D. J. Baek, R. Hovden, B. H. Savitzky, I. El Baggari, P. Liu, S. H. Sung, L. F. Kourkoutis
Cornell University, USA
- 11:10 Invited MD3.I2 (20+10 min): Quantum electron microscopy
K. K. Berggren, N. Abedzadeh, A. Agarwal, C.-S. Kim, R. Hobbs, P. Kruit, Y. Yang
Massachusetts Institute of Technology, USA; Delft University of Technology, Netherlands
- 11:40 MD3.C1 (15+5 min): Electron emission microscopy of scandate cathode emission sites
I. Brodie, B. Vancil
E beam, Inc., USA
- 12:00 MD3.C2 (15+5 min): Low energy electron microscopy study of directionally solidified LaB₆-(Zr, V)B₂ eutectics
T. C. Back, S. B. Fairchild, P. Soukiassian, M.-H. Berger, D. Martinotti, L. Douillard, M. Kordesch, G. Gruen, P. T. Murray, A. K. Schmid, G. Chen, A. Sayir
University of Dayton, USA; Air Force Research Laboratory, USA; Commissariat à l'Energie Atomique, France; Université de ParisSud/Orsay, France; Ecole des Mines de Paris, France; Ohio University, USA; Lawrence Berkeley National Laboratory, USA; NASA Glenn Research Center, USA

12:20-14:00 Rapid fire posters overview, lunch and poster session 3**14:00-15:20 Field-emission 5: properties and applications**

- 14:00 FE5.C1 (15+5 min): Developing field emission electron sources based on ultrananocrystalline diamond for accelerators
S. V. Baryshev, C. Jing, J. Qiu, S. Antipov, V. Jabotinski, J. Shao, W. Gai, A. V. Sumant
Euclid TechLabs LLC, USA; Argonne National Laboratory, USA
- 14:20 FE5.C2 (15+5 min): Intrinsic emittance and coherence of double-gate field emitter arrays
S. Tsujino, P. Das Kanungo, M. Monshipouri, C. Lee, T. Yamada, G. Kassier, R. J. D. Miller
Paul Scherrer Institute, Switzerland; National Institute of Advanced Industrial Science and Technology, Japan; Max Planck Institute for the structure and Dynamics of Matter, Germany
- 14:40 FE5.C3 (15+5 min): A high-performance carbon nanotube-based field emission x-ray tube for commercial dental imaging
S. Park, J.-W. Jeong, J.-W. Kim, J.-T. Kang, J.-H. Yeon, M.-S. Shin, S. Kim, E. Go, H. Jeon, Y. C. Choi, Y.-H. Song
ETRI, Korea; UST, Korea
- 15:00 FE5.C4 (15+5 min): Extraction of the characteristics of limiting elements from field emission measurement data
M. Bachmann, F. Dams, F. Düsberg, M. Hofmann, A. Pahlke, C. Langer, R. Lawrowski, C. Prommesberger, R. Schreiner
Ketek GmbH, Germany; OTH Regensburg, Germany

15:20-15:40 Coffee break**15:40-17:00 Field-emission 6: novel nanoscale emitters**

- 15:40 FE6.C1 (15+5 min): Spin polarization of electrons field-emitted from Cr thin film deposited on W<001> tips
S. Nagai, N. Sakai, K. Miyazaki, H. Toyama, T. Iwata, K. Kajiwara, K. Hata
Mie University, Japan
- 16:00 FE6.C2 (15+5 min): An electron source possessing spatial and temporal coherence: A niobium nanoemitter
W.-T. Chang, J.-L. Hou, C.-C. Shih, Y.-F. Yu, T.-Y. Fu, I.-S. Hwang
Academia Sinica, Taiwan
- 16:20 FE6.C3 (15+5 min): Field emission from three-dimensional epitaxial grown GaN-microrods
R. Lawrowski, C. Langer, C. Prommesberger, R. Schreiner
OTH Regensburg, Germany
- 16:40 FE6.C4 (15+5 min): In-situ study of surface work function, electrical characteristic and field emission property of individual ZnO nanowire
Y. Chen, X. Song, Z. Li, J. She, S. Deng, N. Xu, J. Chen
Sun Yat-sen University, China

POSTER SESSION 1

P1.1. High current density MEMS deuterium ionizers

*M. Araghchini, S. A. Guerrero, A. I. Akinwande
Massachusetts Institute of Technology, USA*

P1.2. Secondary electron emission from novel gate in x-ray tube

*L. Yuan, Z. Zhuoya, L. Wei, Z. Xiaobing, C. Shengcheng, Y. Hua
Southeast University, China*

P1.3. X-ray phase contrast imaging using a micro-focused electron source

*C. Shengcheng, Z. Zhuoya, L. Wei, Z. Xiaobing, L. Yuan, Y. Hua
Southeast University, China*

P1.4. Field emission characteristics of carbon nanotube cold cathode by driving millisecond width pulse voltage

*Y. Tan, W. Zhu, Y. Zhang, J. Chen, N. Xu, S. Deng
Sun Yat-sen University, China*

P1.5. Carrier concentration-dependence of cooling of field emission from n-type semiconductor cathodes

*M. S. Chung, J. Y. Choi, N. M. Miskovsky, P. H. Cutler
University of Ulsan, Korea; Pennsylvania State University, USA*

P1.6. Tip-geometry enhanced cooling of field emission from semiconductor cathodes

*J. Y. Choi, B.-G. Yoon, M. S. Chung
University of Ulsan, Korea*

P1.7. Carbon nanotube fiber array field emission cathodes

*S. B. Fairchild, D. Marincel, T. C. Back
Air Force Research Laboratory, USA; Rice University, USA; University of Dayton, USA*

P1.8. A new analysis of kinked current-voltage-type plots in Lauritsen's 1929 PhD thesis, and some modern implications

*R. G. Forbes
University of Surrey, UK*

P1.9. Comparisons between apex-radius values extracted from Fowler-Nordheim plots and from SEM measurements, for carbon-based field emitters

*R. G. Forbes, A. A. Al-Qudah, S. Alnawasreh, M. A. Madanat, M. S. Mousa
University of Surrey, UK; Mu'tah University, Jordan*

P1.10. Notes on the format of Fowler-Nordheim-type equations

*R. G. Forbes
University of Surrey, UK*

P1.11. On the physical electrostatics of finite field emitter arrays

*R. G. Forbes
University of Surrey, UK*

P1.12. Testing Fowler-Nordheim-type equations

*R. G. Forbes, J. H.B Deane
University of Surrey, UK*

P1.13. Electrical properties of Cs₃Sb photocathode emitters in panel device applications

*H.-S. Jeong, K. Keller, B. Culkin
University of Suwon, Korea; Photegra Corporation, USA*

P1.14. Fabrication of flat-panel lighting devices utilizing cesium antimonide photocathodes as flat electron emitters

*H.-S. Jeong, K. Keller, B. Culkin
University of Suwon, Korea; Photegra Corporation, USA*

P1.15. Fabrication of microplasma devices utilizing various diamond films and CNT/diamond heterostructured films as cathodes

*D. Manoharan, I-N. Lin, Loganathan
Tamkang University, Taiwan; National Tsing Hua University, Taiwan*

POSTER SESSION 1 (continued)

- P1.16. Development of CdTe based photoconductive target for radiation tolerant compact image sensors
T. Masuzawa, Y. Neo, H. Mimura, T. Okamoto, M. Nagao, Y. Gotoh, M. Akiyoshi, N. Sato, I. Takagi
Shizuoka University, Japan; National Institute of Technology, Japan; National Institute of Advanced Industrial Science and Technology, Japan; Kyoto University, Japan; Osaka Prefecture University, Japan
- P1.17. Permeation of electron beam through graphene
T. Masuzawa, Y. Neo, H. Mimura, T. Yamada
Shizuoka University, Japan; National Institute of Advanced Industrial Science and Technology, Japan
- P1.18. Cascade luminescence as a way to increase the energy efficiency of cathodoluminophores
D. I. Ozol
Moscow Institute of Physics and Technology, Russia
- P1.19. Preliminary study of cathode ray tube phosphores on the basis of nanocrystal quantum dots
D. I. Ozol
Moscow Institute of Physics and Technology, Russia
- P1.20. Cold field emission from a low-dimensional paraboloidal tip
A. A. Patterson, A. I. Akinwande
Massachusetts Institute of Technology, USA
- P1.21. New phenomenological model of the so-called “low voltage” field emission
V. E. Pitsin
Russian Academy of Sciences, Russia
- P1.22. Physical and numerical modeling of the stand-alone nanoscale electrical energy generator operating on the bases of abnormal thermal field emission phenomenon at room temperature
V. E. Pitsin
Russian Academy of Sciences, Russia
- P1.23. Resonant tunneling behavior in ion-enhanced field and thermo-field emission
X. Tan, N. Griggs, P. Rumbach, D. B. Go, K. L. Jensen
University of Notre Dame, USA; Naval Research Laboratory, USA
- P1.24. The role of carbon nanotube forest density in thermionic emission
K. Voon, K. Dridi, M. Chowdhury, M. Chang, A. Nojeh
University of British Columbia, Canada
- P1.25. Theoretical and experimental study of characteristics of the planar tetrode with field emission of diamond-like carbon film
N.P. Aban'shin, A.P. Loginov, D.S. Mosiyash, A.N. Yakunin
Volga-Svet Co. Ltd., Russia; Russian Academy of Sciences, Russia
- P1.26. Theoretical research on an 8mm traveling wave tube based on carbon nanotube cold cathode
Z. Yuan, X. Yuan, S. Guo, Y. Yan, Y. Zhang, S. Deng
University of Electronic Science and Technology of China, China; Sun Yat-Sen University, China
- P1.27. Enhancement of interfacial adhesion between carbon nanotube thin film and substrate using a gold-nickel buffer layer
Q. Liang, Y. Zhang, Y. Ke, J. Chen, N. Xu, S. Deng
Sun Yat-Sen University, China
- P1.28. Field emission from graphene sheets grown by RF-PECVD method
N. Zhao, J. Chen, K. Qu, Z. Zhao, W. Lei, X. Zhang
Southeast University, China; Nanjing University of Posts and Telecommunications, China

POSTER SESSION 2

P2.1. Fabrication of single-atom electron sources by use of surface diffusion method

*H. Asai, S. Kumagai, H. Murata, E. Rokuta, C. Oshima
Meijo University, Japan; Waseda University, Japan*

P2.2. Emission from in-situ Ba-coated nanocrystalline graphite/CNT emitters

*R. Gorski, B. Rozansky, H. Busta
Prairie Prototypes, USA*

P2.3. Progress in the development of a multiscale model of the field emission properties of carbon nanotube fibers

*M. Cahay, W. Zhu, N. Perarulan, R. G. Forbes, S. B. Fairchild, T. C. Back, P. T. Murray
University of Cincinnati, USA; University of Surrey, UK; Air Force Research Laboratory, USA; University of Dayton, USA*

P2.4. Carbon nanotube thermionic emitter for a compact SEM gun

*M. Chang, K. Dridi, A. Nojeh, R. F. Pease
University of British Columbia, Canada; Stanford University, USA*

P2.5. Gated p-Si field emission cathode applied in an ionization vacuum gauge

*C. Langer, C. Prommesberger, R. Lawrowski, R. Schreiner, Y. Huang, J. She
OTH Regensburg, Germany; Sun Yat-sen University, China*

P2.6. A 2D/3D image charge for modeling field emission

*K. L. Jensen, D. A. Shiffler, J. R. Harris, I. M. Rittersdorf, J. J. Petillo
Naval Research Laboratory, USA; Air Force Research Laboratory, USA; Leidos, USA*

P2.7. Development of a complete computational method to calculate electron emission currents from sharp dynamically evolving metal tips

*A. Kyritsakis, K. Eimre, V. Zadin, V. Jansson, F. Djurabekova
University of Helsinki, Finland; University of Tartu, Estonia*

P2.8. Atomistic modeling of metal surfaces under high electric fields: direct coupling of electric fields to the atomistic simulations

*M. Veske, A. Kyritsakis, F. Djurabekova, R. Aare, K. Eimre, V. Zadin
University of Helsinki, Finland; University of Tartu, Estonia*

P2.9. Co-doped ZnO thin films prepared by nanocluster-beam deposition: synthesis at various flow rate of helium gas and annealing at different temperature

*X. Li, Z. Zhao
Southeast University, China*

P2.10. The physical principle of spin-polarized field emission

*S.-D. Liang
Sun Yat-sen University, China*

P2.11. Fabrication of single-crystalline SmB₆ nanocone arrays and investigation of their field emission properties

*X. Yang, H. Gan, L. Peng, Y. Tian, J. Chen, S. Deng, N. Xu, F. Liu
Sun Yat-sen University, China*

P2.12. Field emission behaviors of B/LaB₆ hierarchical heterojunction nanostructures

*L. Peng, H. Gan, X. Yang, Y. Tian, J. Chen, S. Deng, N. Xu, F. Liu
Sun Yat-sen University, China*

P2.13. High density current electron emission from graphene

*H. Zhai, J. Liu, C. Le, B. Zeng
University of Electronic Science and Technology of China, China*

P2.14. Thermionic emission from carbon nanotubes

*P. Liu, Y. Wei, L. Liu, K. Jiang, S. Fan
Tsinghua University, China*

P2.15. Coulomb blockade modulated current-voltage characteristic of a diamond field emitter

*S. Mingels, V. Porshyn, D. Lützenkirchen-Hecht, G. Müller, V. I. Kleshch, A. N. Obraztsov
University of Wuppertal, Germany; Moscow State University, Russia; University of Eastern Finland, Finland*

POSTER SESSION 2 (continued)

- P2.16. Atomistic study of field emission current from graphene nano-ribbon and effect of strain on field emission current
M. Behrooz, M. Monshipouri, Y. Abdi
University of Tehran, Iran
- P2.17. First principle method for studying field emission current of carbon nanotubes
M. Monshipouri, M. Behrooz, Y. Abdi
University of Tehran, Iran
- P2.18. Influence of light on field emission from carbon nanotube forests in presence of silver nanoparticles
M. Monshipouri, Y. Abdi, S. Darbari
University of Tehran, Iran; University of Tarbiat Modares, Iran
- P2.19. Work function measurement of Hf-oxide/W(100) surface by using of photoemission electron microscope
H. Nakane, T. Kawakubo
Muroran Institute of Technology, Japan; Kagawa National College of Technology, Japan
- P2.20. A field emission nano-focus x-ray source with effective electron beam focusing module
S. Park, J.-W. Jeong, J.-W. Kim, J.-T. Kang, J.-H. Yeon, M.-S. Shin, S. Kim, E. Go, H. Jeon, Y. C. Choi, Y.-H. Song
ETRI, Korea; UST, Korea
- P2.21. CNT paste emitters with minimal damage during high temperature vacuum brazing fabricated using fillers having low catalytic activities
S. Park, O. Floweri, N. Lee
Sejong University, Korea
- P2.22. Current-voltage characteristic hysteresis dependence on power supply regime for large area field emitters
S. V. Filippov, E. O. Popov, A. G. Kolosko, P. A. Romanov, E. I. Terukov, E. S. Ilin, M.R. Predtechenskiy
A.F. Ioffe Physico-Technical Institute, Russia; St.-Petersburg State Polytechnical University, Russia; The Bonch-Bruевич SPb State University of Telecommunications, Russia; OCSiAl Company, Russia; Kutateladze Institute of Thermophysics, Russia
- P2.23. Extracting formal emission area by on-line processing of current-voltage data, using FN-type equations for the Schottky-Nordheim barrier
E. O. Popov, S. V. Filippov, A. G. Kolosko, P. A. Romanov, R. G. Forbes
A.F. Ioffe Physico-Technical Institute, Russia; Peter the Great St.-Petersburg Polytechnical University, Russia; The Bonch-Bruевич SPb State University of Telecommunications, Russia; University of Surrey, UK
- P2.24. The technique of online analysis of the current-voltage characteristics of nanocomposite field emitters using the SK-charts
A. G. Kolosko, E. O. Popov, S. V. Filippov, I. U. Smirnov, Y. Gotoh
A.F. Ioffe Physico-Technical Institute, Russia; The Bonch-Bruевич SPb State University of Telecommunications, Russia; Peter the Great St.-Petersburg Polytechnical University, Russia; Kyoto University, Japan
- P2.25. Field emission behavior of Au-tip-coated p-type Si pillar structures
P. Serbun, V. Porshyn, G. Müller, S. Mingels, D. Lützenkirchen-Heicht, M. Bachmann, F. Düsberg, F. Dams, M. Hofmann, A. Pahlke, C. Prommesberger, C. Langer, R. Ławrowski, R. Schreiner
University of Wuppertal, Germany; KETEK GmbH, Germany; OTH Regensburg, Germany
- P2.26. Effect of crystallinity of graphene on its field emission character
S. Tang, Y. Zhang, S. Deng, J. Chen, N. Xu
Sun Yat-Sen University, China

POSTER SESSION 3

P3.1. Modeling electron emission from polycrystalline diamonds

*O. Chubenko, S. S. Baturin, S. V. Baryshev
George Washington University, USA; Euclid TechLabs, USA*

P3.2. Improving the extraction of characteristic field enhancement factors from nonlinear Fowler–Nordheim plots in orthodox cold field electron emission

*T. A. de Assis
Federal University of Bahia, Brazil*

P3.3. The consequences of dependence between the formal area efficiency and the macroscopic electric field on linearity behavior in Fowler-Nordheim plots

*T. A. de Assis, F. F. Dall'Agnol, R. F. S. Andrade
Federal University of Bahia, Brazil; Federal University of Santa Catarina, Brazil*

P3.4. Surface morphology and field emitter cathode quality

*D. Enderich, J. Booske, N. Behdad
University of Wisconsin-Madison, USA*

P3.5. Improving oxidation resistance of carbon nanotubes at high temperature using boron and phosphorus compounds

*O. Floweri, S. Park, N. Lee
Sejong University, Korea*

P3.6. Non-resonant emission diode on silicon cathode with diamond like coating

*N. M. Goncharuk, N. F. Karushkin
Research Institute "Orion", Ukraine*

P3.7. Evaluation of current density distribution of field emitted electrons by numerical simulation in conjunction with analytical approach

*Y. Gotoh, H. Tsuji, M. Nagao
Kyoto University, Japan; National Institute of Advanced Industrial Science and Technology, Japan*

P3.8. Effect of microscale gas discharges on thermo-field emission current

*J. R. Haase, D. B. Go
University of Notre Dame, USA*

P3.9. Field emission investigation of composites of polypyrrole with graphene oxide, reduced graphene oxide and graphene nanoribbons

*K. Harpale, S. Bansode, M. More, D. J. Late
University of Pune, India; CSIR-National Chemical Laboratory, India*

P3.10. Spatial mapping of photoemission from plasmonic nanoparticles using electron-beam resists

*R. G. Hobbs, W. P. Putnam, A. Fallahi, Y. Yang, F. X. Kärmer, K. K. Berggren
Massachusetts Institute of Technology, USA; DESY, Germany; University of Hamburg, Germany*

P3.11. High mobility thin-film transistors formed by metal-induced crystallization of amorphous zinc tin oxide semiconductors

*S. T. Kim, N. On, K. J. Lee, H. J. Seul, J. K. Jeong
Hanyang University, Korea*

P3.12. Field emission properties of GNP emitters dependent on gap between anode and cathode

*S. H. Lee, Y. Sun, C. J. Lee, Y.-H. Song
Korea University, Korea; ETRI, Korea*

P3.13. Fabrication of ZnO nanowire field emitter arrays with self-aligned focus electrode structure

*Y. Liu, L. Zhao, Z. Zhang, D. Chen, G. Zhang, J. She, S. Deng, N. Xu, J. Chen
Sun Yat-Sen University, China*

P3.14. Fabrication and characterization of gated ZnO nanowire field electron emitters

*L. Luo, J. She, S. Deng, J. Chen, N. Xu
Sun Yat-Sen University, China*

POSTER SESSION 3 (continued)

- P3.15. Determination of geometrical form factor of emitter from Schottky plot
N. Torii, D. Sugie, H. Murata, E. Rokuta, H. Shimoyama, H. Yasuda, T. Haraguchi
Meijo University, Japan; PARAM Corporation, Japan
- P3.16. Aerospace environmental stability of nanostructured transfer mold amorphous carbon field emitter arrays
M. Nakamoto, J. Moon
Shizuoka University, Japan
- P3.17. Oxygen ratio dependent of positive bias stability and negative bias illumination stability in amorphous IGZO thin-film transistors
N. On, S. T. Kim, K. J. Lee, H. Soel, J. K. Jeong
Hanyang University, Korea
- P3.18. Fabrication of miniature carbon nanotube electron beam module for x-ray tube application
J. H. Hong, J. S. Kang, K. C. Park
Kyung Hee University, Korea
- P3.19. High performance carbon nanotube electron beams with gate electrode optimization
J. S. Kang, K. C. Park
Kyung Hee University, Korea
- P3.20. Pseudo crystalline silicon (pc-Si) thin films with carbon nanotube electron beam exposure
H. R. Lee, J. S. Kang, M. T. Chung, K. C. Park
Kyung Hee University, Korea
- P3.21. Field emission from black silicon structures with integrated gate electrode
C. Prommesberger, C. Langer, R. Lawrowski, R. Schreiner
OTH Regensburg, Germany
- P3.22. Soluble-processed SiO₂ gate insulator fabrication via deep UV curing for amorphous oxide transistors
H. J. Seul, N. On, K. J. Lee, S. T. Kim, J. K. Jeong
Hanyang University, Korea; Inha University, Korea
- P3.23. Single crystalline metallic molybdenum nano-pyramids: preparation and high current field emission properties
Y. Shen, N. Xu, Y. Zhang, J. Chen, J. She, S. Deng
Sun Yat-Sen University, China
- P3.24. High emission performance of carbon nanotube paste field emitters fabricated by graphite filler
Y. Sun, K. N. Yun, S. H. Lee, C. J. Lee
Korea University, Korea
- P3.25. Efficient fabrication of field emitters from super-aligned carbon nanotube arrays
Y. Wei, P. Liu, L. Liu, K. Jiang, Q. Li, S. Fan
Tsinghua University, China
- P3.26. Fabrication of amorphous IGZO thin film transistor for active-driving of ZnO nanowire field emitters
X. Li, X. Chen, Z. Zhang, H. Ou, J. She, S. Deng, N. Xu, J. Chen
Sun Yat-Sen University, China
- P3.27. Tuning field emission properties of tungsten trioxide nanowires for flat panel x-ray source application
P. Xie, D. Chen, G. Zhang, Z. Zhang, F. Liu, J. She, S. Deng, N. Xu, J. Chen
Sun Yat-Sen University, China
- P3.28. Modulation of the work function of graphene by Na and Cl co-adsorbed on opposite sides on graphene
G. Yuan, X. Song, H. Mimura
Ocean University of China, China; Shizuoka University, Japan