

   #oi2019

OPTICAL 2019 INTERCONNECTS

8th ANNUAL IEEE PHOTONICS SOCIETY
OPTICAL INTERCONNECTS CONFERENCE

24 - 26 April 2019

HILTON SANTA FE HISTORIC PLAZA
SANTA FE, NEW MEXICO, USA

CONFERENCE PROGRAM

GENERAL CO-CHAIRS

Stephane Lessard, Ericsson, Sweden
Chen Sun, Ayar Labs, USA

PROGRAM CO-CHAIRS

Katharine Schmidtke, Facebook, USA
Ashkan Seyed, Hewlett Packard Enterprise, USA

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04-24-2019

08:00 - 08:30 **Breakfast/Coffee Break** Canyon Ballroom

WA

08:30 - 09:00 **Opening Remarks** Mesa Ballroom

Moderation: C. Sun, CA/US

WB

09:00 - 09:45 **RF/High-Speed Testing I** Mesa Ballroom

Moderation: J. Bovington, CA/US

09:00 - 09:45 **WB1 - Advancements and Challenges for Electrical Interfaces from 56 Gbps to 112 Gbps and Beyond**

M.P. Li, CA/US

09:45 - 10:15 **Coffee Break/Exhibits** Canyon Ballroom

WC

10:15 - 12:00 **RF/High-Speed Testing II** Mesa Ballroom

Moderation: P. Sun, CA/US

10:15 - 10:45 **WC1 - ULTRA-HIGH-SPEED OPTICAL TRANSMITTERS USING DIGITAL-PREPROCESSED ANALOG-MULTIPLEXED DAC**

H. Yamazaki¹, M. Nagatani¹, H. Wakita¹, Y. Ogiso¹, S. Kanazawa¹, M. Nakamura¹, F. Hamaoka², M. Ida¹, T. Hashimoto¹, H. Nosaka¹, Y. Miyamoto¹; ¹Atsugi, JP, ²Yokosuka, JP

10:45 - 11:00 **WC2 - A 112 GB/S PAM4 CMOS OPTICAL RECEIVER WITH SUB-PJ/BIT ENERGY EFFICIENCY**

G. Balamurugan¹, H. Li¹, M. Sakib², O. Dosunmu², A. Liu², H. Rong², J. Jaussi¹, B. Casper¹; ¹Hillsboro, OR/US, ²Santa Clara, CA/US

11:00 - 11:15 **WC3 - LOW-VOLTAGE 60GB/S NRZ AND 100GB/S PAM4 O-BAND SILICON RING MODULATOR**

Y. Ban¹, J. Verbist², M. Vanhoecke², J. Bauwelinck², P. Verheyen¹, S. Lardenois¹, M. Pantouvaki¹, J. Van Campenhout¹; ¹Heverlee, BE, ²Ghent, BE

11:15 - 11:30 **WC4 - A 50GBIT/S NET ERROR-FREE NRZ 850NM VCSEL BASED OPTICAL INTERCONNECT**

L. Chorchos¹, N. Ledentsov Jr.², M. Agustin², J. Kropp², V.A. Shchukin², V..P. Kalosha², J..P. Turkiewicz¹, N..N. Ledentsov²; ¹Warsaw, PL, ²Berlin, DE

11:30 - 11:45 **WC5 - A 4X25-GBPS MONOLITHICALLY INTEGRATED SI PHOTONIC WDM TRANSMITTER WITH RING MODULATORS**

M. Kim¹, K. Park², W. Oh², C. Mai³, S. Lischke³, L. Zimmermann³, W. Choi¹; ¹Seoul, KR, ²KR, ³DE

11:45 - 12:00 **WC6 - NON-LINEAR SYSTEM IDENTIFICATION SCHEME FOR THE DESIGN OF EFFICIENT COMPENSATORS AND CALIBRATIONS**

H. Faig¹, S. Cohen¹, D. Sadot¹, L. Gantz²; ¹IL, ²Yokneam, IL

12:00 - 13:30 **Lunch Break (ON OWN)**

WD

13:30 - 15:00 **RF/High-Speed Testing III** **Mesa Ballroom**

Moderation: D. Kuchta, US

13:30 - 14:00 **WD1 - A 112 Gb/s Optical Link Based on Silicon Photonics and CMOS Electronics**

H. Rong¹, H. Li², G. Balamurugan², M. Sakib¹, R. Kumar¹, H. Jayatilleka¹, O. Dosunmu¹, A. Liu¹, J. Jaussi², B. Casper²; ¹Santa Clara, CA/US, ²Hillsboro, OR/US

14:00 - 14:15 **WD2 - SELF-HOMODYNE 16-QAM SCHEME FOR LOW COMPLEXITY 200 GBPS DATA CENTER INTERCONNECTS**

R. Kamran, S. Naaz, S. Manikandan, S. Goyal, R. Ashok, S. Gupta; Mumbai, IN

14:15 - 14:30 **WD3 - REAL-TIME DIGITAL SUBCARRIER CROSS-CONNECT BASED ON DISTRIBUTED ARITHMETIC DSP ALGORITHM**

T. XU¹, R. Hui²; ¹KS/US, ²Lawrence, AL/US

14:30 - 15:00 **WD4 - HIGH-SPEED ATTO-JOULE PER BIT PHOTONIC CRYSTAL NANOCAVITY MODULATOR**

E. Li, A. Wang; Corvallis, OR/US

15:00 - 15:30 **Coffee Break/Exhibits**

WE

15:30 - 17:30 **Workshop on 5G** **Mesa Ballroom**

Moderation: S. Lessard, SE
17:30 - 18:30 **Welcome Reception** **Canyon Ballroom**

04-25-2019

08:00 - **Breakfast/Coffee Break** **Canyon Ballroom**
08:30

ThA

08:30 - **Novel Developments/Experiments I** **Mesa Ballroom**
09:15

Moderation: L. Gantz, IL

08:30 - **ThA1 - SCALING SILICON PHOTONICS TRANSCEIVERS FROM 400GBPS TO**
09:15 **BEYOND 1TBPS ON A 300MM WAFER PLATFORM**

E. Timurdogan, MA/US

ThB

09:15 - **Novel Developments/Experiments II** **Mesa Ballroom**
09:45

09:15 - **ThB1 - HIGH-PERFORMANCE SINGLE-MODE POLYMER WAVEGUIDE**
09:30 **DEVICES FOR CHIP-SCALE OPTICAL INTERCONNECTS**

H. Zuo¹, S. Yu¹, X. Wang², J. Liu², X. Sun³, T. Gu⁴, J. Hu¹; ¹Cambridge,
MA/US, ²NH/US, ³CA/US, ⁴MA/US

09:30 - **ThB2 - STATISTICAL BEHAVIORAL MODELS OF SILICON RING**
09:45 **RESONATORS AT A COMMERCIAL CMOS FOUNDRY**

P. Sun¹, J. Hulme¹, T. Van Vaerenbergh¹, J. Rhim¹, D. Kielpinski¹, A. Seyedi¹, M.
Fiorentino¹, R. Beausoleil¹, C. Baudot², F. Boeuf², N. Vulliet²; ¹Palo Alto, CA/US, ²Crolles,
FR

09:45 - **Coffee Break/Exhibits** **Canyon Ballroom**
10:15

ThC

10:15 - **Novel Developments/Experiments III** **Mesa Ballroom**
12:00

10:15 - **ThC1 - Frequency Stabilized Lasers for Coherent Fiber Interconnects in the Datacenter**
10:45

D. Blumenthal¹, H. Ballani², R. Behunin³, J.E. Bowers¹, P. Costa², D. Lenoski¹, N.
McKeown⁴, P. Morton⁵, S.B. Papp⁶, P.T. Rakich⁷; ¹CA/US, ²GB, ³AL/US, ⁴Stanford,
AL/US, ⁵West Friendship, MD/US, ⁶CO/US, ⁷CT/US

10:45 - **ThC2 - SILICON-PLASMONIC ELECTRO-ABSORPTION MODULATOR GATED**
11:00 **BY HIGH MOBILITY INDIUM OXIDE**

Q. Gao, E. Li, A. Wang; Corvallis, OR/US

11:00 - **ThC3 - A DESIGN STUDY OF EFFICIENCY ENHANCEMENT IN SILICON**
11:15 **PHOTONIC THERMO-OPTIC PHASE SHIFTERS**

F. Smith¹, W. Wang¹, X. Wang², Y. Li³, X. Cheng³, H. Wu¹; ¹Rochester,
NY/US, ²CN, ³Shanghai, CN

11:15 - **ThC4 - SILICON MICRORING MODULATOR WITH TRANSPARENT**
11:30 **CONDUCTIVE OXIDE GATE**

E. Li, B. Ashrafi nia, B. Zhou, A. Wang; Corvallis, OR/US

11:30 - **ThC5 - NOVEL DESIGN FOR SUBTERAHERTZ BANDWIDTH ULTRACOMPACT**
11:45 **LITHIUM NIOBATE ELECTROOPTIC MODULATORS ON SILICON**

A. Honardoost¹, F. Arab Juneghani², R. Safian³, S. Fathpour²; ¹FL/US, ²Orlando,
FL/US, ³Kissimmee, FL/US

11:45 - **ThC6 - A HETEROGENEOUSLY INTEGRATED SILICON PHOTONIC/LINBO3**
12:00 **ELECTRO-OPTIC MODULATOR**

N. Boynton, H. Cai, M. Gehl, S. Arterburn, C. Dallo, A. Pomerene, A. Starbuck, D. Hood, D.
Trotter, T. Friedmann, A. Lentine, C. DeRose; NM/US

12:00 - 13:30

Lunch Break (ON OWN)

ThD

13:30 - **Hyperscale DC Requirements**
15:00

Mesa Ballroom

Moderation: J. Stewart, US

13:30 - **ThD1 - PARADIGM SHIFT IN INTRA-DCI SIGNALING**
14:00

R. Motaghian, CA/US

14:00 - **ThD2 - BOARD-LEVEL TRANSCEIVER AND ROUTING TECHNOLOGIES FOR**
14:30 **CHIP-TO-CHIP OPTICAL INTERCONNECT ARCHITECTURES**

T. Alexoudi, M. Moralis-Pegios, S. Pitris, N. Terzenidis, C. Mitsolidou, N. Pleros; GR

14:30 - 15:00 **ThD3 - DATA CENTER SWITCHING: CHALLENGES AND OPPORTUNITIES**

H. Ballani, GB

15:00 - 15:30 **Coffee Break/Exhibits** Canyon Ballroom

ThE

15:30 - 17:30 **Workshop on Co-packaged Optics** Mesa Ballroom
Moderation: K. Schmidtke, CA/US

04-26-2019

08:00 - 08:30 **Breakfast/Coffee Break** Canyon Ballroom

FA

08:30 - 09:45 **Topology Optimization Studies & Simulations I** Mesa Ballroom
Moderation: R. McCormick, NM/US

08:30 - 09:15 **FA1 - INTEGRATED PHOTONICS AND THE EVOLUTION OF ELECTRONIC DESIGN AUTOMATION**

M. Youssef, OR/US

09:15 - 09:30 **FA2 - TIME-EFFICIENT PHOTONIC VARIABILITY SIMULATOR FOR UNCERTAINTY QUANTIFICATION OF PHOTONIC INTEGRATED CIRCUIT**

A. James, X. Meng, A. Gazman, N. Janosik, K. Bergman; New York, NY/US

09:30 - 09:45 **FA3 - BEHAVIORAL MODEL OF SILICON PHOTONICS MICRORING WITH UNEQUAL RING AND BUS WIDTHS**

Y. London¹, T. Van Vaerenbergh², M. Fiorentino², A. Seyed², P. Sun², K. Bergman³; ¹NY/US, ²Palo Alto, CA/US, ³New York, NY/US

09:45 - 10:15 **Coffee Break/Exhibits** Canyon Ballroom

FB

10:15 - 12:00 **Topology Optimization Studies & Simulations II** Mesa Ballroom
Moderation: A. Seyed, CA/US

10:15 - 10:45 **FB1 - The Promise and Perils of Optical Switching within Datacenters**

G. Papen, CA/US

10:45 -
11:00

**FB2 - ENERGY EFFICIENCY ANALYSIS OF COHERENT LINKS FOR
DATACENTERS**

T. Hirokawa¹, S. Pinna², J. Klamkin¹, J. Buckwalter¹, C. Schow³; ¹Santa Barbara,
CA/US, ²CA/US, ³US

11:00 -
11:15

**FB3 - ENERGY EFFICIENCY ANALYSIS OF FREQUENCY COMB SOURCES
FOR SILICON PHOTONIC INTERCONNECTS**

A. Rizzo¹, Y. London², G. Kurczveil³, T. Van Vaerenbergh³, M. Fiorentino³, A. Seyedi³, D.
Livshits⁴, R. Beausoleil³, K. Bergman²; ¹Bronx, NY/US, ²New York, NY/US, ³Palo Alto,
CA/US, ⁴Dortmund, DE

11:15 -
11:30

**FB4 - PARAMETERS-INSENSITIVE MODULATOR FOR OPTICAL
INTERCONNECT SYSTEMS BASED ON DOUBLE INJECTION**

R. Cohen, O. Amrani, S. Ruschin; Tel-Aviv, IL

11:30 -
12:00

FB5 - Requirements of Optical Interconnects for Next Generation Data Centers

Z. Shen, CA/US