CURRICULUM VITAE for DANIEL C. KILPER (2024)

18 Westland Row
Trinity College Dublin
Dublin 2, Ireland
+353 1 86 137 3617
E-mail: dan.kilper@tcd.ie
Website: https://www.tcd.ie/eleceng/research/future-networks-and-communications/
Linkedin: www.linkedin.com/in/dan-kilper-b433a66

SUMMARY:

Prof. Kilper is the Chaired Professor of Future Communication Networks in the School of Engineering and Director of the Science Foundation Ireland CONNECT Centre at Trinity College Dublin, Dublin, Ireland. He is an adjunct faculty member at the Data Science Institute, Columbia University, New York and an adjunct professor in Optical Sciences at the University of Arizona. From 2013-2021 he was a research full professor in Optical Sciences at the University of Arizona. During 2020-2021 he served as a faculty appointee in the NIST Information Technology Lab. His research is aimed at solving fundamental and real world problems in communication networks in order to create a faster, more affordable, and energy efficient Internet, addressing interdisciplinary challenges for smart cities, sustainability, and digital equity. Within both academia and industry, he has made pioneering contributions in communication devices and systems research, primarily spanning three areas: energy efficient communication networks, optical performance monitoring, and optical networking. He is a Professorial Fellow of Trinity College Dublin and a senior member of IEEE. From 2000-2013 he was a Member of Technical Staff in the Advanced Photonics Research Department at Bell Labs and served on the President's Advisory Council for Research. He has served in leadership positions in multi-university/industry centers and consortia that include the Center for Integrated Access Networks (CIAN), Center for Quantum Networks (CQN), Center for Telecommunications Value Chain Research (CTVR) Bell labs Ireland, Center for Energy Efficient Telecommunications (CEET, Univ. of Melbourne, Australia), and the GreenTouch Consortium. He was the founding Technical Committee Chair of GreenTouch. He co-founded two startups, Palo Verde Networks and LightSensAI. He has given plenary or keynote presentations at EuCNC 2020, IEEE/IFIP ONDM 2017, IEEE Green Communications Conference 2011, and E-Energy Conference 2011. He served as general chair of IEEE Green Communications Conference 2014 & 2015 and technical program committee co-chair for IEEE/OSA Photonics in Switching 2013 and IEEE/OSA Photonics in Switching and Computing 2019. He has organized workshops and served on technical program committees at numerous international conferences including CLEO/IQEC, OFC, INFOCOM, ICC, Globecom, ICTON, IFIP, CLEO Europe, and COIN/ACOFT. He is currently serving as a subcommittee chair for OFC and is the Optics Working Group co-chair for the IEEE International Network Generations Roadmap (INGR). He served as topical area editor for the IEEE Transactions on Green Communications and Networking (TGCN). His work has been recognized with the Bell Labs President's Gold Medal and Teamwork Awards. He was recognized as a NIST Communication Technology Lab Innovator for 2019. He holds eleven issued patents and authored six book chapters and more than two hundred peer-reviewed publications.

EDUCATION:

Ph.D. in Physics, 1996 - The University of Michigan, Ann Arbor, MI
Thesis Advisor: Professor Duncan G. Steel
Thesis Title: "Photon-number squeezed light generated by semiconductor lasers: applications and quantum noise processes"
M.S. in Physics, 1992 - The University of Michigan, Ann Arbor, MI

B.S. in Physics, 1990 - Virginia Polytechnic Institute and State University, Blacksburg, VA
B.S. in Electrical Engineering, 1990 - Virginia Polytechnic Institute and State University, Blacksburg, VA

PROFESSIONAL EXPERIENCE:

Trinity College Dublin	2021-present, Professor of Future Communication Networks in the School of Engineering
	2021-present, Director, CONNECT Centre
	2018-2019, Adjunct Professor in the College of Engineering
Columbia University	2018-present, Adjunct Senior Faculty in the Data Science Institute
	2013-2018, Adjunct Faculty in Electrical Engineering
LightSensAI	2024-present, co-founder
Palo Verde Networks	2016-present, co-founder and CTO
University of Arizona	2021-present, Adjunct Professor in Optical Sciences
	2019-2021, Associate Faculty in Applied Mathematics
	2015-2021, Research Professor in Electrical and Computer Engineering, Joint Appointment
	2013-2021, Research Professor in Optical Sciences, graduate college tenure equivalency
NIST, Information Technology Lab	2020-2021, Faculty Appointee, Physicist
Bell Labs, Alcatel-Lucent	2000-2013, Member of Technical Staff
University of North Carolina at Charlotte	1997-2000, Assistant Professor in Physics
Montana State University	1996-1997, Research Scientist in Physics
University of Michigan	1990-1996, Research Assistant in Physics 1992-1994, Teaching Assistant in Physics
VPI&SU	1989-1990, Undergraduate Honors Researcher
IBM, Inc.	1987-1989, Internship in Electrical Engineering

AWARDS/HONORS:

Professorial Fellow, Trinity College Dublin, 2022
NIST Communications Technology Laboratory Innovator, 2019
US-Ireland Research & Development Partnership Award, InterTradeIreland, 2015
IEEE Senior Member, 2007
Central Bell Labs Teamwork Award, Wavebuilder Engineering and Planning Tool Team, 2005
Bell Labs President's Award, Gold Medal, LambdaXtreme Transport System Launch Project, 2004
Junior Faculty Summer Research Fellowship, UNC Charlotte, 1998, 1999
University Regents Graduate Student Fellowship, The University of Michigan, 1990-1993
Graduated Summa Cum Laude and with Honors in Electrical Engineering, VPI&SU, 1990
Loh Outstanding Senior in Physics Award, VPI&SU, 1990
Younger Scholars Award, National Endowment for the Humanities, 1986

ONGOING FUNDED RESEARCH:

"Twilight Digital Twins" SFI Frontiers for the Future, 2024-2028, €1.3M, Co-PI, Research to investigate the use of digital twins for the control and management of optical communication networks.

"6G-XCEL: 6G Trans-Continental Edge Learning" HORIZON-JU-SNS-2023-STREAM-B-01-06 6G R&I Cooperation 2024-2026, €3.1M, Coordinator and Technical Lead PI, EU-US cooperation on AI for 6G to build a decentralised multi-party, multi-network AI framework and methods to validate AI network controls across different testbeds. Project includes 10 EU partners, 10 US partners and nine major initiatives.

"ECO-eNET: Efficient Confluent edge NETworks" HORIZON-JU-SNS-2023-STREAM-B-01-03 6G R&I, 2024-2026, €3.8M, Technical Lead PI, Research on confluent radio and optical technologies to develop dense edge mesh networks for 6G and cell-free wireless systems.

"IrelandQCI: Building a National Quantum Communication Infrastructure for Ireland" Digital Europe EuroQCI, 2023-2025, €10M, Co-PI and Chief Scientist, Testing and staging network infrastructure for future quantum internet technologies.

"Autonomous WDM Link Control" Targetted industry project, NTT, 2023, €15k, Consultancy on the development of autonomous control of optical systems.

"CoQREATE: Convergent Quantum Research Alliance in Telecommunications" SFI US-Ireland Centre to Centre Programme, 2022-2026, €725k, Lead PI, Centre scale research on developing quantum telecommunications networks.

"Smart Balbriggan" Targetted industry project, Fingal County Council, 2022-2024, €250k, Lead PI, Smart Balbriggan smart city research programme to investigate advanced IoT technologies in suburban communities.

"Smart Docklands 3" Targetted industry project, Dublin City Council, 2022-2025, €2M, Smart Docklands smart city research programme on the integration of advanced communication technologies into urban IoT systems.

"CONNECT Phase 2" SFI Centres Programme, 2021-2026, €30M, Lead PI and Director, Multi-university research centre on future networks and communications.

"COSMOS Interconnecting Continents (COSM-IC)" NSF 2020-2023, $3M, Co-PI, Research on cross-layer and cross-domain network experiments involving international collaboration between testbeds.

PAST FUNDED RESEARCH:

"Workshop on Midscale Infrastructure for Quantum Photonic Science, Engineering and Technology" NSF 2020-2021, $46,914, Lead PI, Funding to support a workshop to develop plans for a national scale facility on quantum Internet technologies.

"Quantum repeater for long-distance quantum communication enabled by non-Gaussian cluster states on a scalable hybrid aluminum nitride and silicon nanophotonic platform" NSF 2018-2021, $750k, Co-PI: Investigation to realize the first quantum repeater for an optical quantum communication system, enabling the transfer of quantum-state encoded information between two quantum computers beyond the repeaterless distance limit.

"COSMOS: Cloud-Enhanced Open Software Defined Mobile Wireless Testbed for City-Scale Deployment" NSF 2018-2023, $3.5M, Co-PI: Chief Optical Network Architect: Project to deploy a testbed in New York City to study advanced wireless and optical networking technologies for smart city applications.

"A Novel Architecture for Secure, Energy-Efficient Community-Edge-Clouds with Application in Harlem" NSF, 2017-2021, $1M, Lead PI: Investigate edge clouds supported by high capacity networks to provide affordable high performance computing over disaggregated edge devices including issues of edge cloud governance, community ownership, and technology education in Harlem, New York.

"Indigenous Graduate Education in Science and Engineering in the Southwest" NSF NRT-IGE 2017-2021, $424k, Co-PI: Develop community driven research and graduate education in STEM within native nations using indigenous peoples inspired education models.

"Cloud Infrastructure Renewal Center" (CIRC) Microsoft 2018-2020, $250k, Co-PI: Partnership with Microsoft Azure data center group and Microsoft Research to reinvent data centers from the building architecture to the data networks and computing, including water and energy systems.

"Sustainable Growth of the Cloud" UA Accelerate for Success, 2018-2019, $250k, Co-PI: Seed grant for multi-disciplinary team to develop research and structure for a new center to investigate fundamentally new data centers, including building architecture, environmental systems, optical networks, and computing systems.

"Lighting a Dark Fiber Experimental Research Network in Harlem" NSF, 2016-2019, $219k, Lead PI: Seed funding to build a prototype smart city testbed focused on optical networking research, including software defined networking, radio and optical capabilities.

"TURBO: Terabits/s Using Reconfigurable Bandwidth Optics" Dept. of Energy 2016-2019, $530k, Lead PI: Study software defined transparent path creation in flex grid networks, including transparent cross-domain exchanges based on optical signal to noise ratio monitoring and fast optical power control.

“Resilient and Programmable Metro Optical Networking System” NSF, 2016-2018, $200k, Lead PI: Study programmable reconfigurable optical add drop multiplexer (ROADM) networks with fast optical switching and optical monitoring for emerging New York City applications including 5G mobile fronthaul/backhaul networks.

“Agile Cloud Service Delivery Using Integrated Photonics Networking” NSF, 2015-2018, $800k, Lead PI: Peer reviewed supplement award to the Center for Integrated Access Networks to support center to center collaboration with CONNECT, IPIC, and CSRI centers in the Republic of Ireland and Northern Ireland. Study optical switching in and between data centers including the packaging and system experimentation on large scale integrated photonic switches.

“Optical Networks for 5G Wireless” University of Arizona, LINK Award, 2017-2018, $29k, Lead PI: Arizona TRIF funding for research to develop free space optical technologies to address problems facing 5G wireless networks.

“Facility for packaging of optics with electronics on Silicon chips” University of Arizona, Core Facility Equipment Award, 2017, $330k, Lead PI: Arizona TRIF funding to develop silicon photonic packaging equipment.

“Precision Pick and Place Equipment for Silicon Photonics” University of Arizona, Shared Equipment Grant, 2017, $150k, Lead PI: Arizona TRIF funding to include pick and place capabilities in silicon photonic packaging station.

“Integration of smart utility grids with dynamic optical communication networks for intelligent distribution of power, workload and data in disaster management” NSF, 2013-2015, $400k, Lead PI, Supplement award to the Center for Integrated Access Networks. Study network interdependencies between fiber networks and the electrical power grid.

“Scaling Terabit Networks” NSF 2013-2014, $50k, Lead PI, Workshop stimulating new programs in optical networking within the NSF.

Current Supervised Students and Post-Doctoral Scientists:

Research Fellows: Fiona McDermott, Rishu Raj, Anuj Agrawal, Dmitrii Briantcev, Devika Dass
Research Assistants: Darach Mac Donncha, Grace D’Arcy, Karolina Anielska, Eamonn Donlyn, Clara Butz, Mariana Chihenseck Blanco, Claudia Bailey
PhD Candidates: Sumaiya Ali, Jerry Horgan,Vivek Vasan, Urooj Tariq, Vikash Kumar, Athira Kalavampara Raghunadhan, Shuang Xie
MSc Candidates: Qiwen Tan

Degrees and Research Scientists Supervised:

Dr. Aleksandra Kaszubowska-Anandarajah, Research Fellow, 2023
Reldean Williams, MSc Electrical and Electronic Engineering, 2023
Shuang Xie, MSc Electrical and Electronic Engineering, 2023
Emmanuel Okinrintoyo, MSc Electrical and Electronic Engineering, 2022
Aamir Quraishy, MS Optical Sciences, 2021
Christian Rios, MS Optical Sciences, 2021
Steven Santaniello, MS Optical Sciences, 2021
Jiakai Yu, PhD Electrical and Computer Engineering 2021
Aishik Biswas, MS Optical Sciences, 2020
Shengxiang Zhu, PhD Electrical and Computer Engineering, 2020
Farida Sari, MS Optical Sciences, 2019

Haris Khan Niazi, MS Optical Sciences, 2019
Dr. Yao Li, Post-doctoral scientist, 2016-2018
Weiyang Mo, PhD Optical Sciences 2018
Dr. Houman Rastegarfar, Post-doctoral scientist, 2014-2016
Ajay Sureshbabu, MS Optical Sciences 2015
Atiyah Ahsan, PhD Electrical Engineering 2015 (Columbia University, co-advisor)
Michael Wang, PhD Electrical Engineering 2015 (Columbia University, co-advisor)

KEY ACCOMPLISHMENTS:

Energy Efficient Communication Networks

Dr. Kilper played a leading role in the formation of the GreenTouch Consortium, a global research organization with a mission to enable sustainable communication networks, including the Internet. This activity resulted in an appointment to the top technical leadership position as the Technical Committee Chair. Under his leadership, GreenTouch grew to over 50 member organizations addressing major research problems spanning mobile, wireline access, and core networks. Furthermore, he organized and led a large effort within Bell Labs and among GreenTouch members working on the Service Energy Aware Sustainable Optical Networks (SEASON) project. Under his leadership, his team determined key energy and performance relationships unpinning content delivery networks and future service paradigms such as multi-view video. His team developed energy dependent performance criteria for wavelength switched networks and established requirements for dynamic network stability. His work was recognized through numerous invited talks, keynote presentations, a book chapter, OFC tutorial, and a Proceedings of IEEE invited contribution. He was appointed to the Operations Committee of the Center for Energy Efficient Telecommunications (CEET) at the University of Melbourne and elected by the committee to serve as the Bell Labs Liaison Executive and later chair of the committee. He contributed to the GHG Protocol ICT Sector Guidance documents. He served as editor for the series on green communications for both the IEEE Communications Magazine and the Journal on Selected Areas in Communications (JSAC). He is currently a topical area editor for the new IEEE Transactions on Green Communications and Networking, which was formed from the JSAC series. He also served two terms as general co-Chair for the IEEE Online Greencomm Conference (2014 and 2015). He is currently a member of the Steering Committee for the IEEE Initiative on Green Communications.

Optical Networking: Physical Layer Control, SDN, and AI

Dr. Kilper was a key contributor in an R&D team that developed advanced techniques and algorithms for optical system control that enabled the first continental scale deployment of an end-to-end transparent long haul transmission system. These research contributions were instrumental in the success of the Lucent LambdaXtreme product and resulted in a Bell Labs President's Gold Medal Award, the highest award for large projects within Bell Labs. He also led a research team that conducted pioneering work on the subject of optical channel power dynamics in transparent networks. His team developed and prototyped the transmission design for the Alcatel-Lucent 1850 product which was later incorporated into the 1830 product. He co-developed the ATOM transparent optical mesh network simulator with Chris White. This work led to the first demonstration that power coupling effects can lead to instability in constant gain controlled amplifiers in transparent systems—a key obstacle to real time optical switching in commercial systems. His accomplishments in this area are reviewed in two book chapters, one of which was highlighted by the editors as one of the most noteworthy contributions to the Optical Fiber Telecommunications V books, well known as a comprehensive and high quality text covering all key aspects of optical communication systems research. At the University of Arizona he has developed fast tunable laser based monitoring and stabilization techniques and

incorporated these into a physical layer software defined networking (SDN) controller. His group at Arizona developed a multi-domain SDN controller based on Ryu and ONOS, which is used in the COSMOS testbed in New York City. He developed AI-based optical physical layer control algoritms that predict the power dynamics and quality of transmission. In 2016 he founded Palo Verde Networks to commercialize his SDN based physical layer control techniques to realize fully flexible, software controlled transmission systems.

Optical Performance Monitoring

Dr. Kilper successfully managed a joint research and product development project within Bell Labs on the subject of Optical Performance Monitoring. This team demonstrated and delivered a prototype Q-factor monitoring device to the Lucent Optical business unit. At the same time, the research team made pioneering steps within this emerging topic in optical communication systems. The paper 'Optical Performance Monitoring' J. Lightwave Technology is considered by many to be a seminal work with over 590 citations and was featured among the most impactful papers in the history of J. Lightwave Technology. Another important contribution was the invention of the linear optical sampling technique, which uses coherent homodyne detection to obtain eye and constellation diagrams of high speed optical signals. His studies on the topology and wavelength route dependence for optical monitor placement was recognized with an OFC invited talk.

<u>Ten Career-Best Publications:</u> (Citations reported by Google Scholar)

1. (invited) **D. C. Kilper**, G. Atkinson, S. K. Korotky, S. Goyal, P. Vetter, D. Suvakovic, and O. Blume, "Power Trends in Communication Networks" IEEE J. Sel. Top. Quantum Electron. 17, 275 (2011). **[Citations: 256]**

   Pioneering study that identified the impending network energy bottleneck and is the basis for the formation of the GreenTouch Consortium, hailed as a new paradigm in industry-university research cooperation.

2. (Invited) **D. C. Kilper**, K. Guan, K. Hinton, R. Ayre, "Energy Challenges in Current and Future Optical Transmission Networks", Proc. of IEEE 100, 5, 1168-1187 (2012). **[Citations: 55]**

   Comprehensive analysis on the role of energy in optical transmission networks today and how challenges related to energy efficiency and carbon impact are likely to shape networks in the future.

3. M. D. Feuer, **D. C. Kilper**, and S. Woodward, "ROADMs and Their System Applications," in Optical Fiber Telecommunications V B, eds. I. P. Kaminow, T. Li, and A. E. Willner (Academic Press, San Diego, CA), 2008. **[Citations: 555]**

   The OFT book series is considered the authoritative reference on optical communications and this chapter was highlighted by the editors; comprehensive analysis of key issues in transparent networks.

4. **D. C. Kilper**, R. Bach, D. J. Blumenthal, D. Einstein, T. Landolsi, L. Ostar, M. Preiss, and A. E. Willner, "Optical Performance Monitoring," *J. Lightwave Technol*. **22**, 294 (2004). **[Citations: 594]**

A seminal paper developed out of an OFC Conference workshop that first defined the subject of optical performance monitoring. Recognized in 2016 as one of the most impactful papers in the history of J. Lightwave Technology.

5. **D. C. Kilper**, P. A. Roos, J. L. Carlsten, and K. L. Lear, "Squeezed light generated by a microcavity laser," Phys. Rev. A 55, R3323 (1997). **[Citations: 73]**

   First experimental demonstration of non-classical light generated by a microcavity laser, a key device studied in quantum optics.

6. J. Llorca, K. Guan, G. Atkinson, **D. C. Kilper**, "Energy efficient delivery of immersive video centric services" INFOCOM 2012, 1656-1664 (2012). **[Citations: 18]**

   First theoretical treatment of the energy trade-off between application processing and optical data transport, including network topology and user preference dependence.

7. C. Dorrer, **D. C. Kilper**, H. Stuart, M. Raymer, and G. Raybon, "Linear Optical Sampling" *IEEE Photon. Technol. Lett*. **15**, 1746 (2003). **[Citations: 172]**

   First experimental demonstration of a phase sensitive optical monitoring technique, now a standard method in the study of coherent optical communication systems.

8. F. Quochi, **D. C. Kilper**, J. E. Cunningham, M. Dinu, and J. Shah, "Continuous-wave operation of a 1.3-μm GaAsSb-GaAs quantum-well vertical-cavity surface-emitting laser at room temperature," *IEEE Photon. Technol. Lett.* **13**, 921 (2001). **[Citations: 62]**

   First demonstration of VCSEL lasing at room temperature in the 1.3 micron wavelength region, important in many communication applications.

9. (invited) D. C. Kilper, H. Rastegarfar, "Energy challenges in optical access and aggregation networks" Phil. Trans. R. Soc. A 2016 374 20140435; DOI: 10.1098/rsta.2014.0435 (2016). **[Citations: 20]**

   Analysis of the key energy related bottlenecks in the fiber optic capacity crunch, including network capacity scaling as a function of network diameter.

10. M. Ghobadi, R. Mahajan, A. Phanishayee, N. Devanur, J. Kukarni, G. Ranade, P.-A. Blanche, H. Rastegarfar, M. Glick, and D. Kilper "ProjecToR: Agile Reconfigurable Data Center Interconnect" Proceedings of the 2016 conference on ACM SIGCOMM, pp. 216-229 (2016). **[Citations: 348]**

    Free space optical switching for data centers using a practical high radix diffractive MEMS switch approach and introduced a new seamless control plane for optical and electronic switching.

PROFESSIONAL ACTIVITIES:

TPC Subcommittee Chair, N3, Optical Fiber Communications (OFC) Conference 2024
Advisory Board, Smart Internet Lab, University of Bristol, UK, 2021-present
Editorial Board, Topical Area Editor, IEEE Trans. Green Commun. and Networking, 2020-2024
TPC Member, Optical Fiber Communications Conference (OFC), 2019-2023
TPC Member, Optical Network Design and Modelling Conference, 2017-present
Administrative Director, Center for Quantum Networks (CQN), 2020-2021

General Chair, Workshop on Midscale Infrastructure for Quantum Photonics Science, Engineering, and Technology, NSF workshop, 2020
TPC Member, Asia Communications and Photonics Conference, 2020
TPC Member, Optical Network Design and Modelling Conference, 2020
Director, Center for Integrated Access Networks (CIAN), 2019-2020
Editorial Board, Associate Editor, IEEE Trans. Green Commun. and Networking, 2016-2020
Organizing Committee, NIST Workshop on Machine Learning for Optical Communication Systems 2019
TPC Co-Chair, Photonics in Switching and Computing, 2019
Organizing Committee, OIDA/OSA Workshop on Manufacturing and Building the Supply Chain for Integrated Photonics, San Diego 2019
Steering Committee, IEEE Online Green Communications Conference, 2016-2017
Editorial Board, IEEE/CiC China Communications, 2016-2020
Steering Committee, IEEE Green ICT Initiative, 2015-2020
Series Editor, Green Communication & Networking, IEEE J. Sel. Areas in Comm., 2015-2016.
TPC Co-Chair, IEEE Workshop on Cloud Computing Systems, Networks, and Applications (ICC), 2015
Series Editor, Green Comm. & Computing Networks, IEEE Communications Magazine, 2014-2016
General Chair, IEEE Online Green Communications Conference 2014 & 2015
TPC Chair, Optical Networks, Photonics in Switching 2014
Workshop Chair, OIDA/CIAN Software Defined Photonic and Datacenter Networks, 2014
TPC Member, Globecom 2014 Selected Areas in Communications
TPC Member, Globecom 2014 Green Communication Systems and Networks
TPC Member, ICC 2014 Selected Areas in Communications
Administrative Director, Center for Integrated Access Networks (CIAN), 2013-2019
Workshop Chair, NSF/OSA 'Scaling Terabit Networks', 2013
TPC Member, Globecom 2013 Green Communication Systems and Networks
Invited Speaker & Panel Co-Chair, Globecom 2013 Workshop on Cloud Comp. Sys, Netwks, and App.
Committee Member, IEEE COMSOC Best Readings Topics on Green Communications, 2013
Panel Chair, IEEE INFOCOM 2013, Industry panel on Green Communications, 2013
TWG & co-author, GHG Protocol ICT Sector Guidance, Telecoms Network Services, WRI, WBCSD 2012.
TPC Member, IEEE CCNC, Emerging and Innovative Consumer Technologies and Applications 2013.
TPC Member, IEEE ICC, SAC Green Communication Systems and Networks, 2013.
Operations Committee Chair, Center for Energy Efficient Telecommunications (CEET) 2012
Chair, Industrial Advisory Board, Center for Integrated Access Networks, 2012
Invited Panelist, Entretiens Jacques Cartier 2012
Workshop Chair, Photonics in Switching, Telecom and Energy Forum 2012
Invited Panelist, Photonics in Switching, Workshop on Research directions for Green Networks 2012
Special Issue Editor, Journal of Optical Communications and Networking, 2012
Invited Panelist, WDM and Next Generation Optical Network, 2012.
Invited Panelist, OIDA/CIAN Data Center Workshop, 2012.
Panel Chair, EU Sustainable Energy Week, 'ICT Sustainable Netwks for Sustainable Lifestyles' 2012
Co-Chair, Wireline Core and Access Networks working group, GreenTouch Consortium, 2012
TPC Member, IEEE GLOBECOM, SAC Green Networks and Communication Systems, 2012
TPC Member, SustainIT 2012
Invited Panelist, IEEE ICC, Industry Forum on Green Communications and Computing, 2012
Session Co-Chair, NASA/NSF Workshop on Future Heterogeneous Networks, 2011.
Guest Editor, Special Issue of Computer Networks on 'Green Communication Networks', 2011
Invited Panelist, European Conference on Optical Communications, Symp. on Green Opt. Com., 2011
TPC Member, IEEE GLOBECOM: SAC, Green Communication Systems and Networks, 2011
Invited Panelist, Entretiens Jacques Cartier, 2011
TPC Member, INFOCOM Green Communications Networks Workshop, 2011
TPC Member, IFIP Networks, SUNSET Workshop, Valencia 2011
Workshop Organizer, "Data centers have gone green (or haven't they?)" SC'11, 2011
Operations Committee Member & Bell Labs Liaison Exec., Center for Energy Eff. Telecom., 2010-2012
Chair, Technical Committee, GreenTouch Consortium, 2010-2012
Invited Panelist, IEEE INTELEC 2010
Workshop Chair, 'Are Transparent Networks Manageable?' OFC/NFOEC 2010
IEEE ONTC-PRISM Technical Advisory Board, 2009-2012

Associate Editor, IEEE/OSA Journal of Optical Communications and Networks, 2008-2012
Invited Panelist, International Conference on Constraint Programming 2007
TPC Member, Optical technologies for lightwave communications & networks, CLEO\Europe 2007-2011
TPC Member, Optical network architecture and control, COIN-ACOFT 2007
Deputy Strand Leader, Center for Telecommunications Value Chain Research (CTVR), 2005-2010
Associate Editor, Journal of Optical Networking, 2004-2008
Invited Panelist, "Need for Optical Performance Monitoring" Workshop, OFC 2006
TPC Member, International Quantum Electronics Conference (IQEC) 2004
Bell Labs Advisory Council on Research, 2003-2006
Special issue editor, Journal of Optical Networking, 2003
OSA Leadership Award Committee, 2002-2004, Committee chair 2003-2004.
Workshop Chair, 'Need for Optical Performance Monitoring', OFC 2003
Member, Member and Educational Services Council, Optical Society of America, 2001-2002
Member, Esther B. Hoffman Award Committee, Optical Society of America, 2001-2002
General Chair, OPTO-Southeast Conference, 2000
Organizing Committee, OPTICS, Optical Technology in the Carolinas Conference 1999
Treasurer (1998) and President Pro-Temp (1999), Charlotte Chapter of OSA
Invited Lecturer: ENSSAT, Universite de Rennes, Lannion, France, January 1998, May 1999.

Professional Organizations:
IEEE: LEOS/ComSoc
Optical Society of America/Optica

PATENTS:
D. C. Kilper, Multi-wavelength balanced optical transmission networks, patent #10263722, Issued April 16, 2019.

D. C. Kilper and C. A. White, Positive optical amplifier power transient suppression, patent # 8,995,053, Mar. 31, 2015.

K. Bergman, B. Birand, D. C. Kilper, and G. Zussman, Resilient optical networking, No. WO2016038463 A3, Sept. 11, 2013.

G. Rittenhouse, S. Goyal, D. Kilper, S. Korotky, G. Atkinson, D. Suvakovic, System and method for analyzing network power consumption, No. 13/011,487, January 21, 2011.

J. Llorca, K. Guan, G. Atkinson, D. Kilper, Energy efficient delivery of immersive video centric services, No. 61/512,129, July 27, 2011.

D. C. Kilper, N. Raghavan, E. O. Richey, S. A. Taegar, C. A. White, "Transient-based channel growth for optical transmission systems," patent #7,327,958, Feb. 5, 2008.

M. Dinu, D. C. Kilper, H. R. Stuart, "Performance Monitoring Based On Optical Autocorrelation," patent #7,283,744, Oct. 15, 2007.

D. C. Kilper and C. A. White, Optical amplifier transient control with gain error limits, No. 11/846,845, Aug. 29, 2007.

D. C. Kilper, C. A. Martell, N. Raghavan, D. A. Sadler, C. A. White, "Transient Control in Optical Transmission Systems," patent #7,251,071, July 31, 2007.

H. Garcia, D. C. Kilper, J. M. Roth, C. Xu, "Dynamic Measurement of and Compensation for Impairments to Optical Data Communication Pulses" patent # 7,206,522, April 17, 2007.

D. C. Kilper, J. Leuthold, and P. Vorreau, “Optical performance monitoring using a semiconductor optical amplifier,” patent #7,154,665, December 26, 2006.

C. Doerr, D. C. Kilper, L. Moeller, R. Ryf, and C. Xie, “Orthogonal heterodyne optical signal-to-noise-ratio (OSNR) monitoring method and apparatus”, patent #7,149,407, December 12, 2006.

PUBLICATIONS and NOTEWORTHY PRESENTATIONS:

Keynote/Plenary Presentations

D. Kilper, “Intelligent Optical Systems for a 5G World”, European Conference on Networks and Communication (EuCNC), Dubrovnik, 2020.

D. Kilper, “Data Center Cloud, Fog, Edge, Interconnect Networks: Using SDN to Make Networks Transparent” IEEE/IFIP Optical Network Design and Modeling (ONDM), Budapest, 2017.

D. Kilper, K. Guan, J. Llorca, G. Atkinson “Insights on coding and transmission energy in optical networks” E-ENERGY, New York, 2011.

D. Kilper, “Communication Networks & Sustainability” IEEE GreenComm, 2011.

D. Kilper, “Energy Trends and Challenges in Optical Networks” IPOS Symposium, Sydney, 2011.

Book Chapters

D. Kilper, “Energy Efficiency in Optical Networks” in Springer Handbook on Optical Networks Eds. B. Mukherjee, I. Tomkos, M. Tornatore, P. Winzer, Y. Zhao (Springer, Heidelberg) 2020.

L. Barry, J. Wang, D. Kilper, C. McArdle, “Optical Switching in Data Centers: Architectures Based on Optical Circuit Switching” in Optical Switching in Next Generation Data Centers, eds. L. Pavesi and F. Testa. (Springer International Publishing AG, Cham) 2018.

D. C. Kilper and R. Tucker, “Energy Efficient Telecommunications,” in *Optical Fiber Communications VI*, eds. I. P. Kaminow, T. Li, and A. E. Willner (Academic Press, Burlington, MA), 2013.

D. C. Kilper, “Nonlinear Optical Techniques for OPM" in *Optical Performance Monitoring Techniques for Next Generation Photonic Networks*, eds. Calvin C. K. Chen, (Academic Press, Burlington, MA), 2010.

D. C. Kilper, C. A. White, “Amplifier Issues for Physical Layer Network Control" in *Optical Amplifiers for Advanced Communication Systems and Networks*, eds. J. Zyskind and A. Srivastava, (Academic Press, Burlington, MA), 2011.

M. D. Feuer, D. C. Kilper, and S. Woodward, “ROADMs and Their System Applications,” in *Optical Fiber Communications V B*, eds. I. P. Kaminow, T. Li, and A. E. Willner (Academic Press, Burlington, MA), 2008.

Peer-Reviewed Journal Articles and Published Proceedings

S. A. Khowaja, P. Khuwaja, K. Dev, K. Singh, L. Nkenyereye and D. Kilper, "ZETA: ZEro-Trust Attack Framework with Split Learning for Autonomous Vehicles in 6G Networks," 2024 IEEE Wireless Communications and Networking Conference (WCNC), Dubai, United Arab Emirates, 2024, pp. 1-6, doi: 10.1109/WCNC57260.2024.10571158.

T. Mano et al., "Modeling the Input Power Dependency of Transceiver BER-ONSR for QoT Estimation," 2024 Optical Fiber Communications Conference and Exhibition (OFC), San Diego, CA, USA, 2024, pp. 1-3.

E. Ip et al., "Inline Fiber Type Identification using In-Service Brillouin Optical Time Domain Analysis," 2024 Optical Fiber Communications Conference and Exhibition (OFC), San Diego, CA, USA, 2024, pp. 1-3.

A. Singh, R. Raj and D. Kilper, "Neural Network-based Positioning System for Localisation and 3D Shape Detection in Crowded IoT Networks," 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10466181.

H. Nishizawa et al., "Fast WDM provisioning with minimal probing: the first field experiments for DC exchanges," in Journal of Optical Communications and Networking, vol. 16, no. 2, pp. 233-242, February 2024, doi: 10.1364/JOCN.505729.

Z. Wang, Y. -K. Huang, S. Han, T. Wang, D. Kilper and T. Chen, "Multi-Span Optical Power Spectrum Prediction using ML-based EDFA Models and Cascaded Learning," 2024 Optical Fiber Communications Conference and Exhibition (OFC), San Diego, CA, USA, 2024, pp. 1-3.

Z. Wang et al., "Field Trial of Coexistence and Simultaneous Switching of Real-Time Fiber Sensing and Coherent 400 GbE in a Dense Urban Environment," in Journal of Lightwave Technology, vol. 42, no. 4, pp. 1304-1311, 15 Feb.15, 2024, doi: 10.1109/JLT.2023.3319166.

S. Choudhury et al., "Remote Orchestration of NextG Services Across the Global Internet: An Experimental Study," 2023 IEEE Globecom Workshops (GC Wkshps), Kuala Lumpur, Malaysia, 2023, pp. 1795-1800, doi: 10.1109/GCWkshps58843.2023.10464889.

S. Das, F. Slyne, D. Kilper and M. Ruffini, "Two-tier PON virtualization with scheduler synchronization supporting application-level ultra-low latency in MEC based cloud-RAN, using MESH-PON," in Journal of Optical Communications and Networking, vol. 15, no. 7, pp. C100-C107, July 2023, doi: 10.1364/JOCN.482208.

H. Ma, J. Zhang, Z. Gu, D. C. Kilper and Y. Ji, "Spatio-temporal fragmentation-aware time-varying service provisioning in computing power networks based on model-assisted reinforcement learning," in Journal of Optical Communications and Networking, vol. 15, no. 11, pp. 788-803, November 2023, doi: 10.1364/JOCN.498951.

Z. Wang, D. C. Kilper and T. Chen, "Open EDFA gain spectrum dataset and its applications in data-driven EDFA gain modeling," in Journal of Optical Communications and Networking, vol. 15, no. 9, pp. 588-599, September 2023, doi: 10.1364/JOCN.491901.

R. Raj, S. Xie, Z. Wang, T. Chen and D. Kilper, "Digital Twin Modelling of Cascaded Amplifiers in the COSMOS Testbed," 2023 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), Jaipur, India, 2023, pp. 1-6, doi: 10.1109/ANTS59832.2023.10468684.

D. Kilper et al., "Optics," 2023 IEEE Future Networks World Forum (FNWF), Baltimore, MD, USA, 2023, pp. 1-65, doi: 10.1109/FNWF58287.2023.10520470.

H. Ma, J. Zhang, Z. Gu, D. C. Kilper and Y. Ji, "Once-for-all: 3D auxiliary graph driven by heterogeneous GAT for multi-tenant adaptive slicing in multi-layer computing power networks," 49th European Conference on Optical Communications (ECOC 2023), Hybrid Conference, Glasgow, UK, 2023, pp. 783-786, doi: 10.1049/icp.2023.2338.

A. Raj, Z. Wang, F. Slyne, T. Chen, D. Kilper and M. Ruffini, "Self-normalizing neural network, enabling one shot transfer learning for modeling EDFA wavelength dependent gain," 49th European Conference on Optical Communications (ECOC 2023), Hybrid Conference, Glasgow, UK, 2023, pp. 748-751, doi: 10.1049/icp.2023.2325.

V. Karunakaran et al., "Model-based service provisioning in optical networks," 49th European Conference on Optical Communications (ECOC 2023), Hybrid Conference, Glasgow, UK, 2023, pp. 1039-1042, doi: 10.1049/icp.2023.2429.

T. Mano et al., "First field demonstration of automatic WDM optical path provisioning over alien access links for data center exchange," 49th European Conference on Optical Communications (ECOC 2023), Hybrid Conference, Glasgow, UK, 2023, pp. 234-237, doi: 10.1049/icp.2023.2048.

A. Delmade, F. Slyne, C. Browning, D. Kilper, B. Liam and M. Ruffini, "Metro access network with convergence of coherent and analog RoF data services," 49th European Conference on Optical Communications (ECOC 2023), Hybrid Conference, Glasgow, UK, 2023, pp. 1366-1369, doi: 10.1049/icp.2023.2547.

R. Raj, S. Xie, Z. Wang, T. Chen and D. Kilper, "Machine learning-based Raman tilt prediction in a ROADM transmission system," 49th European Conference on Optical Communications (ECOC 2023), Hybrid Conference, Glasgow, UK, 2023, pp. 1504-1507, doi: 10.1049/icp.2023.2606.

K. Kaeval et al., "Employing channel probing to derive end-of-life service margins for optical spectrum services," in Journal of Optical Communications and Networking, vol. 15, no. 7, pp. C63-C73, July 2023, doi: 10.1364/JOCN.480080.

Emmanuel Akinrintoyo, Zehao Wang, Bob Lantz, Tingjun Chen, Dan Kilper, “(INVITED) Reconfigurable topology testbeds: A new approach to optical system experiments”, Optical Fiber Technology, Volume 76, 2023, 103243, ISSN 1068-5200, https://doi.org/10.1016/j.yofte.2023.103243.

J. Horgan, D. Briantcev, A. Kaszubowska-Anandarajah, M. Ruffini and D. Kilper, "Progress on Integrating Quantum Communications in Optical Systems Testbeds," 2023 Asia Communications and Photonics Conference/2023 International Photonics and Optoelectronics Meetings (ACP/POEM), Wuhan, China, 2023, pp. 1-5, doi: 10.1109/ACP/POEM59049.2023.10368715.

Y. -K. Huang et al., "Field Trial of Coexistence and Simultaneous Switching of Real-time Fiber Sensing and 400GbE Supporting DCI and 5G Mobile Services," 2023 Optical Fiber Communications Conference and Exhibition (OFC), San Diego, CA, USA, 2023, pp. 1-3, doi: 10.1364/OFC.2023.W3H.4.

Z. Wang, D. Kilper and T. Chen, "Transfer Learning-based ROADM EDFA Wavelength Dependent Gain Prediction Using Minimized Data Collection," 2023 Optical Fiber Communications Conference and Exhibition (OFC), San Diego, CA, USA, 2023, pp. 1-3, doi: 10.1364/OFC.2023.Th2A.1.

J. Müller et al., "Experimental Demonstration of ML-Based DWDM System Margin Estimation," 2023 Optical Fiber Communications Conference and Exhibition (OFC), San Diego, CA, USA, 2023, pp. 1-3, doi: 10.1364/OFC.2023.Tu2F.2.

H. Dong et al., "Towards Enabling Residential Virtual-Desktop Computing," in IEEE Transactions on Cloud Computing, vol. 11, no. 1, pp. 745-762, 1 Jan.-March 2023, doi: 10.1109/TCC.2021.3113905.

D. Kilper et al., "INGR Roadmap Optics Chapter," 2022 IEEE Future Networks World Forum (FNWF), Montreal, QC, Canada, 2022, pp. 1-56, doi: 10.1109/FNWF55208.2022.00140.

Z. Wang, E. Akinrintoyo, D. Kilper and T. Chen, "Optical Signal Spectrum Prediction Using Machine Learning and In-line Channel Monitors in a Multi-span ROADM System," 2022 European Conference on Optical Communication (ECOC), Basel, Switzerland, 2022, pp. 1-4.

S. Das, F. Slyne, D. Kilper and M. Ruffini, "Schedulers Synchronization Supporting Ultra Reliable Low Latency Communications (URLLC) in Cloud-RAN over Virtualised Mesh PON," 2022 European Conference on Optical Communication (ECOC), Basel, Switzerland, 2022, pp. 1-4.

K. Kaeval et al., "Exploring Service Margins for Optical Spectrum Services," 2022 European Conference on Optical Communication (ECOC), Basel, Switzerland, 2022, pp. 1-4.

T. Chen et al., "A Software-Defined Programmable Testbed for Beyond 5G Optical-Wireless Experimentation at City-Scale," in IEEE Network, vol. 36, no. 2, pp. 90-99, March/April 2022, doi: 10.1109/MNET.006.2100605.

D. Kilper, J. Yu and S. Santaniello, "Optical Networking in Smart City and Wireless Future Networks Platforms," European Conference on Optical Communication (ECOC), 2021, pp. 1-4, doi: 10.1109/ECOC52684.2021.9605836.

I. Tillman, D. Kilper and A. Battou, "Entanglement Blocking in DLCZ-based Networks," Optical Fiber Communications Conference and Exhibition (OFC), 2021, pp. 1-3.

A. A. Díaz-Montiel et al., "Real-Time Control Plane Operations for gOSNR QoT Estimation through OSNR Monitoring," Optical Fiber Communications Conference and Exhibition (OFC), 2021, pp. 1-3.

B. Lantz et al., "SDN-controlled Dynamic Front-haul Provisioning, Emulated on Hardware and Virtual COSMOS Optical x-Haul Testbeds," Optical Fiber Communications Conference and Exhibition (OFC), 2021, pp. 1-3.

D. Kilper et al., "Using the Capacity and Low Latency of Mobile Edge Clouds for Community Applications," Optical Fiber Communications Conference and Exhibition (OFC), 2021, pp. 1-3.

A. A. Díaz-Montiel, B. Lantz, J. Yu, D. Kilper and M. Ruffini, "Real-Time QoT Estimation Through SDN Control Plane Monitoring Evaluated in Mininet-Optical," in IEEE Photonics Technology Letters, vol. 33, no. 18, pp. 1050-1053, 15 Sept.15, 2021, doi: 10.1109/LPT.2021.3075277.

J. Yu, S. Zhu, C. L. Gutterman, G. Zussman, and D. C. Kilper, "Machine-learning-based EDFA gain estimation [Invited]," J. Opt. Commun. Netw. 13, B83-B91 (2021).

D. Raychaudhuri, I. Seskar, G. Zussman, T. Korakis, D. Kilper, T. Chen, J. Kolodziejski, M. Sherman, Z. Kostic, X. Gu, H. Krishnaswamy, S. Maheshwari, P. Skrimponis, and C. Gutterman, “Challenge: COSMOS: A city-scale programmable testbed for experimentation with advanced wireless,” in *Proc. ACM MobiCom’20*.

J. Gordon, A. Battou and D. Kilper, "Workshop on Machine Learning for Optical Communication Systems: A Summary," *2020 Optical Fiber Communications Conference and Exhibition (OFC)*, San Diego, CA, USA, 2020, pp. 1-3.

Daniel C. Kilper and Nasser Peyghambarian, "Changing evolution of optical communication systems at the network edges," *Appl. Opt*. 59, G209-G218, 2020; in James C Wyant College of Optical Sciences special issue.

I. Tillman, A. Rubenok, J. Yu, Y. Li, S. Guha, and D. Kilper “Shared Measurement Node Placement in Continuous Variable Measurement Device Independent Quantum Networks” OSA Quantum 2.0 Conference, paper QW6B.15, 2020.

D. Danh Le, L. P. Barry, D. C. Kilper, P. Perry, J. Wang and C. McArdle “AgileDCN: An Agile Reconfigurable Optical Data Center Network Architecture” *J. Lightwave Technology* 38, 18, pp. 4922-4934, 2020.

K. Guan, J. E. Simsarian, F. Boitier, D. Kilper, J. Pesic, and M. Sherman “Efficient Classification of Polarization Events Based on Field Measurements” Optical Fiber Communication (OFC) Conference, OSA, paper Th3D.7, 2020.

A. Minakhmetov, C. Gutterman, T. Chen, J. Yu, C. Ware, L. Iannone, D. Kilper and G. Zussman, “Experiments on Cloud-RAN Wireless Handover using Optical Switching in a Dense Urban Testbed” Optical Fiber Communication (OFC) Conference, OSA, paper Th2A.25, 2020.

J. Yu, C. Gutterman, A. Minakhmetov, M. Sherman, T. Chen, S. Zhu, G. Zussman, I. Seskar, and D. Kilper “Dual Use SDN Controller for Management and Experimentation in a Field Deployed Testbed” Optical Fiber Communication (OFC) Conference, OSA, paper T3J.3, 2020.

C. Gutterman, A. Minakhmetov, J. Yu, M. Sherman, T. Chen, S. Zhu, I. Seskar, D. Raychaudhuri, D. kilper, G. Zussman “Programmable Optical x-Haul Network in the COSMOS Testbed” 2019 IEEE 27th International Conference on Network Protocols (ICNP) doi: 10.1109/ICNP.2019.8888108.

(Invited Tutorial) D. Kilper “Optical disaggregation and the role of SDN in converging mobile, access, and cloud networks” European Conference on Optical Communications (ECOC) 2019.

J. Yu, Y.-K. Huang, S. Zhang, E. Ip, D. C. Kilper, T. J. Xia. G. A. Wellbrock, "Neural-Network-Based G-OSNR Estimation of Probabilistic-Shaped 144QAM Channels in DWDM Metro Network Field Trial," 2019 24th OptoElectronics and Communications Conference (OECC) and 2019 International Conference on Photonics in Switching and Computing (PSC), Fukuoka, Japan, 2019.

S. Zhu, J. Yu, T. Adams, and D. Kilper “AI-Based Control for Edge Cloud Optical Networks” in Asia Communications and Photonics (ACP) Conference, paper S3C.3, 2019.

(Invited) D. C. Kilper, T. A. Adams, F. AlAli, R. D. Williams, and M. Veeraraghavan “Optical Networks in Edge Clouds: Energy and Application Dimensions” 2019 24th OptoElectronics and Communications Conference (OECC) and 2019 International Conference on Photonics in Switching and Computing (PSC), Fukuoka, Japan, 2019.

(Invited) J. Yu, T. Chen, C. Gutterman, S. Zhu, G. Zussman, I. Seskar, and D. Kilper “COSMOS: Optical Architecture and Prototyping” in Proceedings of the Optical Fiber Communication Conference (OFC), OSA, paper M3G.3, 2019.

J. Yu, W. Mo, Y. Huang, E. Ip and D. C. Kilper, "Model transfer of QoT prediction in optical networks based on artificial neural networks," *IEEE/OSA J. Opt. Commun. Netw*., **11**, 10, C48-C57 (2019).

F. Alali, T. Adams, R. W. Foley, D. Kilper, R. D. Williams, M. Veeraraghavan, “Objective and subjective evaluation of zero client computing under network packet loss” IEEE Access, **7**, 94569-94582 (2019).

(Invited) Y. Li, D. C. Kilper “Optical Physical Layer SDN” *IEEE/OSA J. Opt. Commun. Netw*., **10**, 1, A110-A121 (2018).

W. Mo, C. L. Gutterman, Y. Li, S. Zhu, G. Zussman and D. C. Kilper, "Deep-neural-network-based wavelength selection and switching in ROADM systems," *IEEE/OSA J. Opt. Commun. Netw.* **10**, 10, D1-D11, (2018), doi: 10.1364/JOCN.10.0000D1.

(Invited) Y. Li, W. Mo, S. Zhu, Y. Shen, J. Yu, P. Samadi, K. Bergman, D. C. Kilper “tSDX: Enabling Impairment-Aware All-Optical Inter-Domain Exchange” *J. Lightwave Technol*. **36**, 142-154 (2018).

(Invited) D. Kilper, S. Zhu, J. Yu, “Physical Layer Control for Dis-aggregated Optical Systems” in Asia Communication and Photonics (ACP) Conference, paper Su1J.1, 2018.

S. Zhu, C. L. Gutterman, W. Mo, Y. Li, G. Zussman, D. C. Kilper “Machine Learning Based Prediction of Erbium-Doped Fiber WDM Line Amplifier Gain Spectra” In Proc. European Conference on Optical Communications (ECOC), paper Mo3E.6, 2018.

M. Ruffini and D. C. Kilper “From Central Office Cloudification to Optical Network Disaggregation” IEEE Photonics Society Summer Topical Meeting Series, 153-154, 2018.

A. A. Diaz-Montiel, J. Yu, W. Mo, Y. Li, D. C. Kilper, M. Ruffini “Performance analysis of QoT estimator in SDN-controlled ROADM networks” IEEE Proceedings of the International Conference on Optical Network Design and Modelling (ONDM), 142-147, 2018.

J. Yu, Y. Li, M. Bhopalwala, S. Das, M. Ruffini, D. C. Kilper “Midhaul Transmission Using Edge Data Centers with Split PHY Processing and Wavelength Reassignment for 5G Wireless Networks” IEEE Proceedings of the International Conference on Optical Network Design and Modelling (ONDM), 178-183, 2018.

W. Mo, Y.-K. Huang, S. Zhang, E. Ip, D. C. Kilper, Y. Aono, and T. Tajima “ANN-Based Transfer Learning for QoT Prediction in Real-Time Mixed Line-Rate Systems” Proceedings of the Optical Fiber Communications (OFC) Conference, OSA, paper W4F.3, 2018.

W. Mo, C. L. Gutterman, Y. Li, G. Zussman, D. C. Kilper “Deep Neural Network Based Dynamic Resource Reallocation of BBU Pools in 5G C-RAN Networks” Proceedings of the Optical Fiber Communications (OFC) Conference, OSA, paper Th1B.4, 2018.

Y. Li, M. Bhopalwala, S. Das, J. Yu, W. Mo, M. Ruffini, D. C. Kilper “Joint Optimization of BBU Pool Allocation and Selection for C-RAN Networks” Proceedings of the Optical Fiber Communications (OFC) Conference, OSA, paper Th1B.5, 2018.

Y. Li, M. Yang, W. Mo, S. Zhu, Z. Qu, I. B. Djordjevic, D. C. Kilper “Hysteresis-Based Margin Allocation for Adaptive Coding in SDN-enabled Optical Networks” Proceedings of the Optical Fiber Communications (OFC) Conference, OSA, paper Th1D.2, 2018.

W. Mo, S. Zhu, Y. Li, and D. C. Kilper “EDFA Wavelength Dependent Gain Spectrum Measurement Using Weak Optical Probe Sampling” *IEEE Photon. Technol. Lett*. **30**, 2, 177-180 (2018).

C. L. Gutterman, W. Mo, S. Zhu, Y. Li, D. C. Kilper, G. Zussman “Neural Network based Wavelength Assignment in Optical Switching” ACM SIGCOMM Workshop on Big Data Analytics and Machine Learning for Data Communication Networks (Big-DAMA 2017).

W. Mo, M. Bhopalwala, H. Rastegarfar, D. C. Kilper “Proactive and Non-Disruptive Channel Probing for Wavelength Switching in Optical Transmission” *Photon. J*. **9**, 6, seq. no. 7907807 (2017).

W. Mo, S. Zhu, Y. Li, D. C. Kilper “Dual-Wavelength Source Based Optical Circuit Switching and Wavelength Reconfiguration in Multi-Hop ROADM Systems” *Opt. Express* **25**, 27736-27749 (2017).

Z. Qu, Y. Li, W. Mo, M. Yang, S. Zhu, D. C. Kilper, I. B. Djordjevic “Performance Optimization of PM-16QAM Transmission System Enabled by Real-time Self-adaptive Coding” *Opt. Lett*. **42**, 4211-4214 (2017).

L. Chiaraviglio, N. Blefari-Melazzi, W. Liu, J. A. Gutierrez, J. van de Beek, R. Birke, L. Chen, F. Idzikowski, D. Kilper, P. Monti, A. Bagula, J. Wu “Bringing 5G in Rural and Low-Income Areas: Is it Feasible?” *IEEE Comm. Stan. Mag*. **1**, 3, 50-57 (2017).

Y. Li, W. Mo, S. Zhu, Y. Shen, J. Yu, P. Samadi, K. Bergman, D. C. Kilper "Transparent Software-Defined Exchange (tSDX) with Real-Time OSNR-Based Impairment-Aware Wavelength Path Provisioning across Multi-Domain Optical Networks." Optical Fiber Communications (OFC) Conference, Th5A.2, 2017.

(invited) D. C. Kilper and Y. Li, “Optical Physical Layer SDN: Enabling Physical Layer Programmability through Open Control Systems” Optical Fiber Communications (OFC) Conference, paper W1H.3, 2017.

S. Zhu, W. Mo, D. C. Kilper, A. P. Anthur, and L. Barry “Dual Laser Switching for Dynamic Wavelength Operation in Amplified Optical Transmission” Optical Fiber Communications (OFC) Conference, paper TH2A.44, 2017.

M. Ghobadi, R. Mahajan, A. Phanishayee, N. Devanur, J. Kukarni, G. Ranade, P.-A. Blanche, H. Rastegarfar, M. Glick, and D. Kilper “ProjecToR: Agile Reconfigurable Data Center Interconnect” Proceedings of the 2016 conference on ACM SIGCOMM, pp. 216-229 (2016).

H. Rastegarfar and D. C. Kilper, “Robust software-defined optical networking for the power grid” IEEE International Conference on Computing, Networking, and Communications (ICNC) 2016, DOI: 10.1109/ICCNC.2016.7440552

K. Kvaternik, J. Llorca, D. Kilper, L. Pavel, “A methodology for the design of self-optimizing, decentralized content-caching strategies” *IEEE/ACM Trans. On Networking* **24**, 5, 2634-2647 (2016).

M. Ghobadi, J. Gaudette, R. Mahajan, A. Phanishayee, B. Klinkers, D. Kilper, “Evaluation of elastic modulation gains in microsoft’s optical backbone in North America” in Proceedings of Optical Fiber Communications (OFC) Conference, 2016.

H. Rastegarfar, D. C. Kilper, M. Glick, and N. Peyghambarian, “Topology Implications in Cyber-Physical Software-Defined Optical Transmission Networks” Optical Fiber Communications Conference (OFC), paper Th4G.1, 2016.

L. Chiaraviglio, N. Blefari-Melazzi, W. Liu, J. A. Gutierrez, J. Van De Beek, R. Birke, L. Chen, F. Idzikowski, D. Kilper, P. Monti, J. Wu “5G in Rural and Low Income Areas: Are we Ready?” ITU Kaleidoscope Conference, paper S4.1 (2016).

(invited) D. C. Kilper, H. Rastegarfar, “Energy challenges in optical access and aggregation networks” Phil. Trans. R. Soc. A 2016 374 20140435; DOI: 10.1098/rsta.2014.0435 (2016).

M. Bhopalwala, H. Rastegarfar, D. C. Kilper, M. Wang, K. Bergman, “Energy efficiency of optical grooming of QAM optical transmission channels” *Opt. Express* **24**, 3, pp. 2749-2764 (2016).

A. S. Ahsan, C. Browning, M. S. Wang, K. Bergman, D. C. Kilper, L. P. Barry “Excursion-free dynamic wavelength switching in amplified optical networks” *IEEE/OSA J. Opt. Comm. Netw*. **7**, 9, pp. 898-905, 2015.

H. Rastegarfar, D. C. Kilper, M. Glick, N. Peyghambarian, “Cyber-physical interdependency in dynamic software-defined optical transmission networks” *IEEE/OSA J. Opt. Comm. Netw*. **7**, 12, pp. 1126-1134 (2015).

M. Bhopalwala, H. Rastegarfar, D. C. Kilper “Energy efficiency of electronic and optical QAM signal grooming” IEEE Online Conferenece on Green Communications 2015, pp. 59-65.

(invited) D. Kilper, M. Bhopalwala, H. Rategarfar, W. Mo “Optical power dynamics in wavelength layer software defined networking” OSA NETWORKS 2015, paper NeT2F.2.

W. Mo, S. Johnson, M. Yang, M. Cvijetic, A. Ahsan, W. Gao, D. Kilper, K. Bergman, J. Wissinger, J. Zhu, “OFDM pilot-tone assisted distributed control for SDN-based elastic optical networks” IEEE Optical Interconnects Conference (OI) 2015, 96-97.

A. Almaiman, M. R. Chitgarha, W. Daab, M. Ziyadi, A. Mohajerin-Ariaei, S. Khaleghi, M. Willner, V. Vusirikala, X. Zhao, D. Kilper, L. Parachis, A. Ahsan, M. Wang, K. Bergman, M. Tur, J. D. Touch, A. E. Willner “Experimental demonstration of robustness and accuracy of an MZI-based OSNR monitor under transmitter drift and reconfigurable networking conditions for pol-muxed 25-Gbaud QPSK and 16-QAM channels” in Optical Fiber Communication Conference (OFC) 2014, OSA Technical Digest (CD) (Optical Society of America, 2014), W2A.30.

K. Kvaternik, J. Llorca, D. Kilper, and L. Pavel “Decentralized caching strategies for energy efficient content delivery” IEEE International Conference on Communications (ICC) 2014, 3707-3713.

J. Tsai, Z. Wang, Y. Pan, D. C. Kilper, and L. Pavel “Stability analysis in a multi-channel quasi-ring optical network” American Control Conference (ACC) 2014, 2154-2159.

B. Birand, H. Wang, K. Bergman, D. Kilper, T. Nandagopal, and G. Zussman “Real-time power control for dynamic optical networks—algorithms and experimentation” *IEEE J. Sel. Areas Comm.* **32**, 8, 1615-1628 (2014).

Z. Wang, J. Tsai, Y. Pan, D. Kilper, L. Pavel “Control for suppression of channel power excursions in ROADM-based WDM chain networks” *J. Lightwave Technol.* **32**, 2, 293-302 (2014).

A. Ahsan, M. Wang, M. R. Chitgarha, D. Kilper, A. E. Willner, K. Bergman, “Autonomous OSNR Monitoring and Cross-Layer Control in a Mixed Bit-Rate and Modulation Format System Using Pilot Tones” Photonic Networks and Devices Conference, paper NT4C.3 (2014).

W. Zhang, Y. Wen, K. Guan, D. Kilper, H. Luo, D. O. Wu “Energy-optimal mobile cloud computing under stochastic wireless channel” *IEEE Transactions on Wireless Communications* **12**, 9, 4569-4581 (2013).

J. Llorca, A. M. Tulino, K. Guan, J. Esteban, M. Varvello, N. Choi, D. C. Kilper “Dynamic in-network caching for energy efficient content delivery” Proceedings of IEEE INFOCOM 2013, 245-249.

(invited) D. C. Kilper, M. S. Wang, A. Ahsan, K. Bergman “Efficient and agile optical networks” International Conference on Optical Network Design and Modeling (ONDM) 2013, 217-222.

K. Guan, B.S.G. Pillai, A. Vishwanath, D. C. Kilper, J. Llorca “The impact of error control on energy-efficient reliable data transfers over optical networks” IEEE International Conference on Communications (ICC) 2013, 4083-4088.

B. Birand, H. Wang, K. Bergman, D. Kilper, T. Nandagopal, G. Zussman “Real-time power control for dynamic optical networks – algorithms and experimentation” International Conference on Network Protocols (ICNP) 2013, 1-12.

J. Llorca, A. M. Tulino, K. Guan, D. C. Kilper “Network-coded caching-aided multicast for efficient content delivery” IEEE International Conference on Communications (ICC) 2013, 3557-3562.

Y. Jin, Y. Wen, K. Guan, D. C. Kilper “Toward monetary cost effective content placement in cloud centric media network” IEEE International Conference on Multimedia and Expo (ICME) 2013, 1-6.

Z. Wang, J. Tsai, Y. Pan, D. Kilper, L. Pavel “Control of channel power excursions at sudden reconfiguration or faults in a ROADM-based WDM network” Conference on Control and Fault-Tolerant Systems (SysTol) 2013, 548-553.

C. A. Chan, A. F. Gygax, E. Wong, C. A. Leckie, A. Nirmalathas, and D. C. Kilper “Methodologies for assessing the use-phase power consumption and greenhouse gas emissions of telecommunications network services” *Environ. Sci Technol*. **47**, 485-492 (2012).

K. Guan, D. C. Kilper, Y. Pan, O. Rival, A. Morea “Energy efficient file transfer over rate adaptive optical networks” IEEE Online Conference on Green Communications (GreenComm) 2012, 38-43.

(invited) K. Kvaternik, J. Llorca, D. Kilper, L. Pavel “Decentralized optimization with partial overlaps: application to energy-aware caching strategies in content-centric networks” Allerton Conference on Communication, Control, and Computing 2012, 41-47.

J. Junio, D. C. Kilper, V. W. S. Chan, “Channel power excursions from single-step channel provisioning” *J. Opt. Comm. Netw.* **4**, 9, A1-A7 (2012).

C. A. Chan, E. Wong, A. F. Gygax, C. A. Leckie, A. Nirmalathas, D. C. Kilper “Energy star rating for future telecom services: motivation, methodologies, and challenges” Asia Communications and Photonics (ACP) Conference 2012, ATh1D.2.

N. Choi, K. Guan, D. Kilper, G. Atkinson, “In-network caching effect on optimal energy consumption in content-centric networking” IEEE International Conference on Communications (ICC) 2012, 2889-2894.

J. Llorca, K. Guan, G. Atkinson, D. Kilper, “Energy benefit of distributed in-network processing for personalized media service delivery” IEEE International Conference on Communications (ICC) 2012, 2901-2906.

T. Nandagopal, K. Guan, D. C. Kilper, “Energy Efficiency and Delay Performances of Dynamic Optical Switching for Data Transfers,” IEEE International Conference on Communications (ICC) 2012, Workshop on Green Communications and Networking, pp. 5962- 5967.

Z. Wang, J. Tsai, L. Pavel, Y. Pan, D. C. Kilper, “Oscillation analysis for a quasi-ring optical network” American Control Conference (ACC) 2012, ThA13.1.

Y. Pan, D. C. Kilper, A. Morea, V. Chan, “Channel power excursions in GMPLS end-to-end optical restoration with single step wavelength tuning” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2012, OSA Technical Digest (CD) (Optical Society of America, 2012), JTh2A42.

(Invited) D. C. Kilper, K. Guan, K. Hinton, R. Ayre, “Energy Challenges in Current and Future Optical Transmission Networks”, *Proc. of IEEE* **100**, 5, 1168-1187 (2012).

J. Llorca, K. Guan, G. Atkinson, D. C. Kilper, “Energy efficient delivery of immersive video centric services” Proceedings of INFOCOM 2012, 1656-1664.

(Invited) D. Kilper, K. Guan, J. Llorca, G. Atkinson, R. Tucker, “Coding and capacity in efficient optical networks” Opto-Electronics and Communications Conference (OECC) 2011, paper 5B3.5

(Invited) D. Kilper, K. Guan, G. Atkinson, J. Llorca, Y. Pan, “Modeling network energy reductions through dynamic wavelength functionality” International Conference on Transparent Optical Networks (ICTON) 2011, Th.A3.2

K. Guan, G. Atkinson, D. C. Kilper, E. Gulsen, “On the energy efficiency of content delivery architectures” The 4th IEEE International Conference on Communications (ICC) Workshop on Green Communications 2011.

K. Guan, D. C. Kilper, G. Atkinson, “Evaluating the energy benefit of dynamic optical bypass for content delivery” INFOCOM Green Communications Workshop 2011.

J. A. O’Dowd, W. H. Guo, E. Flood, M. Lynch, A. L. Bradley, D. C. Kilper, and J. F. Donegan, “Polarisation dependence of two-photon absorption generated by band-limited amplified spontaneous emission noise in silicon avalanche photodiodes” *Electron. Lett*. **47**, 25, 1390-1391 (2011).

(Invited Tutorial) D. C. Kilper, “Energy Efficient Networks” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2011, OSA Technical Digest (CD) (Optical Society of America, 2011), OWI5.

Y. Pan, D. Kilper, G. Atkinson, “Persistent channel power deviations in constant gain amplified long-chain ROADM networks” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2011, OSA Technical Digest (CD) (Optical Society of America, 2011), JWA10.

U. Lee, I. Rimac, D. Kilper, V. Hilt, “Toward energy-efficient content dissemination” *IEEE Network* **25**, 2, 14-19 (2011).

(Invited) D. C. Kilper, G. Atkinson, S. K. Korotky, S. Goyal, P. Vetter, D. Suvakovic, and O. Blume, “Power Trends in Communication Networks” *IEEE J. Sel. Top. Quantum Electron*. **17**, 275 (2011).

D. J. Bishop, A. R. Hartmann, D. C. Kilper, S. K. Korotky, D. Suvakovic, “Energy Efficient Networking: Avoiding a Future Energy Crunch” Military Communications Conference (MILCOM) 2010, 2390-2392.

(Invited) J. Kim, D. C. Kilper, S. K. Korotky, “Energy Challenges in Communication Networks” Korean Information Society, 2010.

(Invited) D. C. Kilper, D. Neilson, D. Stiliadis, D. Suvakovic, S. Goyal, “Fundamental Limits on Energy Use in Optical Networks” European Conference on Optical Communications (ECOC) 2010, Tu.3.D.1.

(Invited) D. C. Kilper, G. Atkinson, S. K. Korotky, “Optical Transparency and Network Energy Efficiency” International Conference on Transparent Optical Networks (ICTON) 2010, We.A1.5

(Invited) D. C. Kilper, G. Atkinson, S. K. Korotky “Optical Transmission Energy Consumption in the Internet” in Frontiers in Optics 2010/Laser Science XXVI, OSA Technical Digest (CD) (Optical Society of America, 2010), FTuA2.

D. C. Kilper, S. Chandrasekhar, C. White, B. Lavigne “Channel Power Transients in Erbium Doped Fiber Amplified Reconfigurable Transmission Systems" *Bell Labs Tech. J*. **14**, 4, 73-84 (2009).

A. Morea, D. C. Kilper, D. Verchere, R. Douville "Wavelength Layer Recovery in Transparent Optical Networks" *Bell Labs Tech. J*. **14**, 4, 193-211 (2009).

(Invited) D. C. Kilper, “Optical Power Management in Optical Wavelength Switched Core Networks" Wireless and Optical Communications Conference (WOCC) 2009, O1.4.

F. Smyth, D. C. Kilper, L. P. Barry, S. Chandrasekhar, “Applied Constant Gain Amplification in Circulating Loop Experiments" *J. Lightwave Technol*. **27**, 4686-4696 (2009).

(Invited) A. Morea, D. C. Kilper, I. S. Lin, F. Leplingard, S. Chandrasekhar, T. Zami, J.-C. Antona, “Testbed methods to study physical layer path establishment in long haul optical wavelength switched networks” International Conference on Transparent Optical Networks (ICTON) 2009.

D. C. Kilper, C. Xie, and C. A. White, "Cumulative Channel Gain Saturation in Cascaded Backward-Pumped All-Raman Transmission Spans" European Conference on Lasers and Electro-Optics and European Quantum Electronics Conference (CLEO/Europe-EQEC) 2009, CI1.1.

(Invited) D. C. Kilper A. Ferguson, B. O'Sullivan, S. Korotky, "Impact of Topology and Traffic on Physical Layer Monitoring in Transparent Networks" in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2009, OSA Technical Digest (CD) (Optical Society of America, 2009), OWI3.

(Invited) A. Morea, D. C. Kilper, I. Lin, F. Leplingard, S. Chandrasekhar, T. Zami, J.-C. Antona, "Testbed Methods to Study Physical Layer Path Establishment in Long Haul Optical Wavelength Switched Networks" International Conference on Transparent Optical Networks (ICTON) 2009, Tu.C2.4.

A. Ferguson, B. O’Sullivan, and D. C. Kilper, “Impact of wavelength route correlation on the optimal placement of optical monitors in transparent mesh networks” European Conference on Optical Communications (ECOC) 2008, We.1.B.4.

D. C. Kilper, D. Bayart, S. Chandrasekhar, A. Morea, S. K. Korotky, F. Leplingard, “Mesh network transport experiments using a distributed-distance circulating loop” European Conference on Optical Communications (ECOC) 2008, We.3.D.5.

D. C. Kilper, F. Smyth, L. P. Barry, S. Chandrasekhar, “Power divergence due to wavelength rerouting in long haul circulating loop experiments” European Conference on Optical Communications (ECOC) 2008, P.5.08.

(Invited) D. C. Kilper, C. A. White, S. Chandrasekhar, “Signal power transients in transparent networks” Digest of the IEEE/LEOS Summer Topical Meetings 2008, 161-162.

(Invited) D. C. Kilper, S. Chandrasekhar, F. Smyth, L. P. Barry, “Dynamic circulating-loop methods for transmission experiments in optically transparent networks” International Conference on Transparent Optical Networks (ICTON) 2008, 99-102.

W. H. Guo, J. O'Dowd, M. Lynch, A. L. Bradley, J. F. Donegan, L. P. Barry, D. C. Kilper, “Two-photon absorption generated by optically amplified signals” *Electron. Lett.* **44**, 18, 1087-1088 (2008).

D. C. Kilper, C. A. White, and S. Chandrasekhar, “Control of channel power instabilities in constant gain amplified transparent networks using scalable mesh scheduling” *J. Lightwave Technol*. **26**, 108-113 (2008).

S. Chandrasekhar, X. Liu, D. C. Kilper, A. H. Gnauck, C. R. Doerr, E. Burrows, L.L. Buhl, “Terabit Transmission at 42.7 Gb/s on 50 GHz Grid Using Hybrid RZ-DQPSK and NRZ-DBPSK Formats over 16x80 km SSMF Spans and 4 Bandwidth-Managed ROADMs” *J. Lightwave Technol.* **26**, 85-90 (2008).

D. C. Kilper, A. R. Grant, T. K. Ho, T. Salamon, and C. A. White, “Wavelength-dependent channel power transient response in broadband Raman-amplified transmission” *J. Opt. Netw*. **7**, 132-141 (2008).

M. Ruffini, D. C. Kilper, D. O’Mahony, L. Doyle, “Cost study of dynamically transparent networks” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2008, OSA Technical Digest (CD) (Optical Society of America, 2008), OMG2.

D. C. Kilper, C. A. White, and S. Chandrasekhar, “Channel power coupling in constant gain controlled amplifiers” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2008, OSA Technical Digest (CD) (Optical Society of America, 2008), JThA14.

(Invited) C. A. White and D. C. Kilper, “Power stability and control in optically transparent mesh networks” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2008, OSA Technical Digest (CD) (Optical Society of America, 2008), OThI1.

A. Ferguson, B. O’Sullivan, and D. C. Kilper, “Transparent path length optimized optical monitor placement in transparent mesh networks” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2008, OSA Technical Digest (CD) (Optical Society of America, 2008), OThI3.

F. Smyth, J. O'Dowd, D. C. Kilper, J. E. Simsarian, L. P. Barry, B. Roycroft, B. Corbett, "10 Gbit/s modulation of a fast switching slotted Fabry-Perot Tunable Laser" European Conference on Lasers and Electro-Optics and International Quantum Electronics Conference (CLEO/Europe-IQEC) 2007.

J. O'Dowd, D. C. Kilper, W. H. Guo, J. F. Donegan, S. Chandrasekhar, "Optical channel monitoring using two photon absorption" European Conference on Lasers and Electro-Optics and International Quantum Electronics Conference (CLEO/Europe-IQEC) 2007.

D. C. Kilper, A. R. Grant, T. K. Ho, T. Salamon, and C. A. White, "Surviving channel dependence of fast power transients in a 109 channel Raman-amplified transmission experiment" European Conference on Lasers and Electro-Optics and International Quantum Electronics Conference (CLEO/Europe-IQEC) 2007.

C. A. White and D. C. Kilper, "Dynamic control domains to achieve power stability in optically transparent mesh networks" European Conference on Optical Communications (ECOC) 2007, 8.5.5.

(post-deadline) S. Chandrasekhar, X. Liu, D. C. Kilper, A. H. Gnauck, C. R. Doerr, E. Burrows, L.L. Buhl, "0.8 bit/s/Hz Terabit Transmission at 42.7 Gb/s Using Hybrid RZ-DQPSK and NRZ-DBPSK Formats over 16x80 km SSMF Spans and 4 Bandwidth-Managed ROADMs" in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2007, OSA Technical Digest (CD) (Optical Society of America, 2007), PDP-28.

(post-deadline) D. C. Kilper, C. A. White, S. Chandrasekhar, "Control of Channel Power Instabilities in Transparent Networks Using Scalable Mesh Scheduling" in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2007, OSA Technical Digest (CD) (Optical Society of America, 2007), PDP-11.

D. C. Kilper, S. Chandrasekhar, E. Burrows, L. L. Buhl, J. C. Centanni, "Local Dispersion Map Deviations in Metro-Regional Transmission Investigated Using a Dynamically Re-Configurable Re-Circulating Loop" in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2007, OSA Technical Digest (CD) (Optical Society of America, 2007), OthL5.

S. Chandrasekhar, D. C. Kilper, X. Zheng, D. Mahgerefteh, Y. Matsui, K. McCallion, Z. Fan, P. Tayebati, "Evaluation of Chirp-Managed Lasers in a Dispersion Managed DWDM Transmission over 24 Spans" in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2007, OSA Technical Digest (CD) (Optical Society of America, 2007), OthL7.

C. Xie, D. C. Kilper, L. Moeller, and R. Ryf, "Orthogonal-Polarization Heterodyne OSNR Monitoring Insensitive to Polarization Mode Dispersion and Nonlinear Polarization Scattering" *J. Lightwave Technol.* **25**, 177 (2007).

D. C. Kilper, S. Chandrasekhar, and C. A. White, "Transient Gain Dynamics of Cascaded Erbium Doped Fiber Amplifiers with Re-configured Channel Loading," in Optical Fiber Communication Conference and Exposition and The National Fiber Optic Engineers Conference (OFC/NFOEC) on CD-ROM (Optical Society of America, Washington, DC, 2006), OTuK6.

(post-deadline) C. Xie, D. C. Kilper, L. Möller, and R. Ryf, “Orthogonal Polarization Heterodyne OSNR Monitoring Technique Insensitive to Polarization Effects,” in Optical Fiber Communication Conference/National Fiber Optic Engineers Conference (OFC/NFOEC) 2006, OSA Technical Digest (CD) (Optical Society of America, 2006), PDP10.

C. C. Chekuri, P. Claisse, R.-J. Essiambre, S. Fortune, D. C. Kilper, W. Lee, N. K. Nithi, I. Saniee, B. Shepard, C. A. White, G. Wilfong, and L. Zhang, “Design Tools for Transparent Optical Networks,” *Bell Labs Tech. J.* **11**, 2, 129 (2006).

D. Kilper, M. Waldow, W. Etter, and C. Xie, “Control Process Gain of Erbium Doped Fiber Amplifiers with Wavelength Division Multiplexed Signals,” in Optical Amplifiers and Their Applications and Coherent Optical Technologies and Applications (OAA/COTA) on CD-ROM (The Optical Society of America, Washington, DC 2006), JWB8.

(Invited) D. C. Kilper, C. A. White, S. Chandrasekhar, W. Etter, M. Waldow, and P. Vorreau, “Amplifier dynamics in optically transparent mesh networks” in The 5th International Conference on Optical Internet (COIN) 2006, WeB1-1.

(post-deadline) X. Liu, S. Chandrasekhar, A. H. Gnauck, C. R. Doerr, I. Kang,D. Kilper, L. L. Buhl, and J. Centanni, "DSP-Enabled Compensation of Demodulator Phase Error and Sensitivity Improvement in Direct-Detection 40-Gb/s DQPSK," European Conference on Optical Communications (ECOC) 2006, Th4.4.5.

D. C. Kilper and C. A White, “Fundamental Saturated-Amplifier Channel-Power Dynamics in Transparent Networks,” European Conference on Optical Communications (ECOC) 2005, We.p.96.

P. Vorreau, D. C. Kilper, and C. A. White, “Gain Saturation Spectrum of Backward-Pumped Broadband Raman Amplifiers,” *IEEE Photonics Technol. Lett*. **17**, 1405 (2005).

T. K. Ho, T. Salamon, R. W. Freund, C. A. White, B. K. Hillyer, L. C. Cowsar, C. J. Nuzman, and D. C. Kilper, “Simulation of Power Evolution and Control Dynamics in Optical Transport Systems,” *Bell Labs Tech. J*. **10**, SPR, 119 (2005).

C. Xie, D. C. Kilper, “Influence of polarization scattering on polarization-assisted OSNR monitoring in dense WDM systems with NZ-DSF and Raman Amplification” in *Optical Fiber Communication Conference (OFC) on CD-ROM* (The Optical Society of America, Washington, DC, 2005) 474.

P. Vorreau, D. C. Kilper, and J. Leuthold, “Optical Noise and Dispersion Monitoring with SOA-based Optical 2R Regenerator,” *IEEE Photonics Technol. Lett*. **17**, 244 (2005).

M. Dinu, D. C. Kilper, and H. R. Stuart, “Characterization of signal quality by data stream optical autocorrelation” in Conference on Lasers and Electro-Optics (CLEO), 2004 OSA Technical Digest Series (Optical Society of America, Washington, D.C. 2004), CThLL3.

D. C. Kilper, W. Weingartner, S. Hunsche, and A. Azarov, “Q-factor monitoring using FEC for fault management applications,” *J. Opt. Netw*. **3**, 651 (2004).

D. C. Kilper, S. Chandrasekhar, G. Kramer, and X. Wei, “Quantum limits for receiver sensitivity with coding,” in *Optical Fiber Communication Conference (OFC) on CD-ROM* (The Optical Society of America, Washington, DC, 2004), WM1.

A. R. Grant and D. C. Kilper, “Signal transient propagation in an all Raman amplified system,” in *Optical Fiber Communication Conference (OFC) on CD-ROM* (The Optical Society of America, Washington, DC, 2004), ThT3.

D. C. Kilper, A. Azarov, W. Weingartner, and P. Vorreau, “Q-factor monitoring for fault management applications,” in *Optical Fiber Communication Conference (OFC) on CD-ROM* (The Optical Society of America, Washington, DC, 2004), FH3.

D. C. Kilper, R. Bach, D. J. Blumenthal, D. Einstein, T. Landolsi, L. Ostar, M. Preiss, and A. E. Willner, “Optical Performance Monitoring,” *J. Lightwave Technol*. **22**, 294 (2004).

C. Xie, L. Moeller, D. C. Kilper, and L. Mollenauer, “Effect of cross-phase modulation induced polarization scattering on optical PMD compensation performance in WDM systems” *Opt. Lett*. **28**, 2303 (2003).

C. Dorrer, D. C. Kilper, H. Stuart, M. Raymer, and G. Raybon, “Linear Optical Sampling” *IEEE Photon. Technol. Lett*. **15**, 1746 (2003).

D. C. Kilper, P. Vorreau, and J. Leuthold, “Noise and distortion monitoring in SOA-based optical 2R regeneration” European Conference on Optical Communications (ECOC) 2003, We4.P.132.

D. C. Kilper and W. Weingartner, “Monitoring optical performance degradation due to amplifier noise” *J. Lightwave Technol.* **21**, 1171 (2003).

D. C. Kilper, S. Chandrasekhar, L. Buhl, A. Agarwal, and D. Maywar, “Spectral monitoring of OSNR in high-speed networks”, European Conference on Optical Communications (ECOC) 2002, 7.4.4.

W. Weingartner and D. C. Kilper, “OSNR monitoring for fault management in high-speed networks”, European Conference on Optical Communications (ECOC) 2002, 7.4.5.

(post-deadline) C. J. Dorrer, D. C. Kilper, H. R. Stuart and G. Raybon, “Ultra-sensitive optical sampling by coherent-linear detection” in *Optical Fiber Communication Conference (OFC) on CD-ROM* (The Optical Society of America, Washington, DC, 2002) FD5.

C. J. Dorrer and D. C. Kilper, “Phase effects in nonlinear optical sampling,” in Conference on Lasers and Electro-Optics (CLEO), 2002 OSA Technical Digest Series (Optical Society of America, Washington, D.C. 2002) CThK4.

D. C. Kilper, F. Quochi, J. Cunningham, and M. Dinu, “High speed dynamics of GaAsSb vertical cavity lasers,” *IEEE Photon. Technol. Lett.* **14**, 438 (2002).

J. E. Cunningham, M. Dinu, J. Shah, F. Quochi, D. Kilper, W. Y. Jan, M. D. Williams, A. Mills, W. E. Henderson, “Growth and optical properties of GaAsSb quantum wells for 1.3 um VCSELs,” *J. Vac. Sci Technol. B* **19**, 1948 (2001).

W. S. Hobson, J. Lopata, L. M. F. Chirovsky, S. N. G. Chu, G. Dang, B. Lou, F. Ren, M. Tayahi, D. C. Kilper, S. J. Pearton, “Small and large signal performance and gain switching of intra-cavity contacted, shallow implant apertured VCSELs,” *Solid State Electron* **45**, 1639 (2001).

F. Quochi, D. C. Kilper, J. E. Cunningham, M. Dinu, and J. Shah, “Continuous-wave operation of a 1.3-μm GaAsSb-GaAs quantum-well vertical-cavity surface-emitting laser at room temperature,” *IEEE Photon. Technol. Lett.* **13**, 921 (2001).

D. C. Kilper, K. Croussore, E. Rowell, and M.Y.A. Raja, “Polarization dependent intensity noise in Er/Yb co-doped fiber lasers,” in *OSA Trends in Optics and Photonics (TOPS) Vol. 56, Conference on Lasers and Electro-Optics (CLEO 2001)*, Technical Digest, Postconference Edition (Optical Society of America, Washington, DC, 2001).

F. Quochi, J. E. Cunningham, D. C. Kilper, M. Dinu, and J. Shah, “Room temperature CW operation of GaAsSb/GaAs VCSELs near 1.3 mm,” in *OSA Trends in Optics and Photonics (TOPS) Vol. 56, Conference on Lasers and Electro-Optics (CLEO 2001)*, Technical Digest, Postconference Edition (Optical Society of America, Washington, DC, 2001).

R. Gabet, G. M. Stephan, M. Bondiou, and D. Kilper, “Ultrahigh sensitivity detector for coherent light: the laser,” Opt. Comm. **185**, 109 (2000).

S. Blin, G. M. Stephan, R. Gabet, P. Besnard, and D. Kilper, “Amplification process in a laser injected by a narrow band weak signal,” Europhys. Lett. **52**, 60 (2000).

B. Rouse and D. C. Kilper, “Nonclassical number-phase correlation in semiconductor lasers,” Quantum Electronics and Laser Science Conference, OSA, San Francisco, CA, 2000.

P. A. Roos, J. L. Carlsten, D. C. Kilper and K. L. Lear, "Diffraction from Oxide Apertures in Vertical Cavity Lasers," Appl. Phys. Lett. **75**, 754 (1999).

P.A. Roos, D. C. Kilper, J. L. Carlsten, and K. L. Lear, “Diffraction from Oxide Confinement Apertures in VCSELs,” in *Conference on Lasers and Electro-Optics*, 1998 OSA Technical Digest Series (Optical Society of America, Washington, D.C. 1998).

D. C. Kilper, P. A. Roos, J. L. Carlsten, and K. L. Lear, "Quantum spatial-mode intensity-noise correlation in oxide-confined, vertical-cavity lasers," in *OSA Topics in Optics and Photonics, Advances in Vertical Cavity Surface Emitting lasers*, ed. C. J. Chang-Hasnain, v. 15 (Optical Society of America, Washington, D. C., 1997).

D. C. Kilper, P. A. Roos, J. L. Carlsten, and K. L. Lear, "Squeezed light generated by a microcavity laser," Phys. Rev. A **55**, R3323 (1997).

D. C. Kilper, P. A. Roos, J. L. Carlsten, and K. L. Lear, "Squeezed light generated in a microcavity laser," in *Quantum Electronics and Laser Science Conference*, **12**, 1997 OSA Technical Digest Series (Optical Society of America, Washington, D.C. 1997).

P. A. Roos, D. C. Kilper, J. L. Carlsten, and K. L. Lear, "Quantum transverse mode intensity noise in oxide-confined vertical-cavity lasers," in *Conference on Lasers and Electro-Optics*, **11**, 1997 OSA Technical Digest Series (Optical Society of America, Washington, D. C. 1997).

D. C. Kilper, P. A. Roos, J. L. Carlsten, and K. L. Lear, "Quantum mode correlations in vertical cavity surface emitting lasers," in *Quantum Optoelectronics*, **9**, 1997 OSA Technical Digest Series (Optical Society of America, Washington, D. C. 1997).

D. C. Kilper, A. C. Schaefer, J. Erland, and D. G. Steel, "Coherent nonlinear optical spectroscopy using photon-number squeezed light," *Phys. Rev. A* **54**, R1785 (1996).

D. C. Kilper, D. G. Steel, R. Craig, and D. R. Scifres, "Polarization-dependent noise in photon-number squeezed light generated by quantum-well lasers," *Opt. Lett*. **21**, 1283 (1996).

D. C. Kilper, A. C. Schaefer, J. Erland, and D. G. Steel, "Coherent nonlinear optical spectroscopy using photon-number squeezed light," in *Quantum Electronics and Laser Science Conference*, **10**, 1996 OSA Technical Digest Series (Optical Society of America, Washington, D. C. 1996).

D. C. Kilper, J. Erland, and D. G. Steel, "Ultra-sensitive measurement with amplitude squeezed light," in *Quantum Electronics and Laser Science Conference*, **16**, 1995 OSA Technical Digest Series (Optical Society of America, Washington, D. C. 1995).

(Invited) D. C. Kilper, M. J. Freeman, J. Erland, D. G. Steel, R. Craig, and D. R. Scifres, "Amplitude squeezed light generated by semiconductor quantum well lasers," in *Quantum Electronics and Laser Science Conference*, **16**, 1995 OSA Technical Digest Series (Optical Society of America, Washington, D. C. 1995).

(Invited) D. C. Kilper, M. J. Freeman, D. G. Steel, R. Craig, and D. R. Scifres, "Non-classical amplitude squeezed light generated by semiconductor quantum well lasers," in Proc. SPIE **2378**, 64 (1995).

M. J. Freeman, D. C. Kilper, D. G. Steel, R. Craig, and D. R. Scifres, "Room-temperature amplitude-squeezed light from an injection-locked quantum-well laser with a time-varying drive current," Opt. Lett. **20**, 183 (1995).

Noteworthy Non-Peer Reviewed Papers and Conference Presentations

D. Kilper, J. Thompson, Y. Zhang and K. Huang, "IEEE Transactions on Green Communications and Computing: New Research Scope," in *IEEE Transactions on Green Communications and Networking*, vol. 4, no. 4, pp. 939-943, Dec. 2020, doi: 10.1109/TGCN.2020.3032213.

D. Kilper, K. Bergman, V. W. S. Chen, I. Monga, G. Porter, and K. Rauschenbach, "Optical Networks Come of Age," OSA Optics and Photonics News, 50-57 (Sept 2014).

(Invited) D. C. Kilper, “Energy Targets and Metrics for Scalable Optical Networks” Optical Communications: Future Directions & Metrics in Aggregation Networks: an OIDA Road-mapping Workshop, San Jose, CA 2011.

(Invited) D. C. Kilper, “Energy Efficient Optics: Where and What for?” ECOC Symposium on Green Optical Communications, Geneva 2011.

(Invited) D. C. Kilper, “Physical Layer Networks: the Verdant Canopy of ICT” Entretiens Jacques Cartier, Montreal 2011.

(invited) D. C. Kilper, “GreenTouch Consortium: Building the Roadmap” ON*VECTOR Meeting, CALIT2, UCSD La Jolla, CA 2011.

(Invited) D. C. Kilper, “Looking Beyond Today’s Networks: Why and How” University of Maryland Green Communications Workshop, College Park, MD 2010.

D. C. Kilper, “Sustainability: Network Transformation & GreenTouch” Center for Energy Efficient Telecommunications (CEET) Inaugural Meeting, Melbourne 2010.

D. C. Kilper, “Network Energy Use: GreenTouch Perspective” GreenTouch Open Forum, Amsterdam 2010.

D. C. Kilper, “GreenTouch: Why, What, and How”, GreenTouch ECOC Workshop, Torino 2010.

(Invited) D. C. Kilper, “Network Energy Use: Challenges Today and Looking Forward” Microphotonics Center Fall Meeting, MIT, Boston, 2010.

(Invited) D. C. Kilper, “Sustainability: Network Transformation” Annual Meeting of the International Bar Association, Vancouver, 2010.

(Invited) D. C. Kilper, “Understanding Energy Use in Communication Networks” Stanford Photonics Research Center Annual Symposium, Stanford 2010.

(Invited) D. C. Kilper, “GreenTouch and Photonics” ON*VECTOR Meeting, CALIT2, UCSD La Jolla, CA 2010.

(Invited) D. C. Kilper, “Network Energy: Why Efficiency Matters” INTELEC 2010, Orlando.

D. C. Kilper, “GreenTouch: Why, What, and How” GreenTouch Meeting, London 2010.

D. C. Kilper, “Trends and Challenges in Network Energy Consumption” HHI-T Labs-BL Workshop, Berlin, 2010.

D. C. Kilper, W. Weingartner, C. Xie, A.Azarov, P. Vorreau, and J. Leuthold , “Network Applications and Metrics for Optical Performance Monitoring,” OECC 2005, Seoul, South Korea, 6B3-1.

D. C. Kilper, C. R. Giles, W. Weingartner, A. Azarov, P. Vorreau, and J. Leuthold, “Optical Performance Monitoring Applications in Transparent Networks,” WOCC 2005, Newark, New Jersey, F6-1.

D. C. Kilper, C. J. Dorrer, and H. R. Stuart, “Ultrafast optical sampling using balanced homodyne detection,” OSA Annual 2002, Orlando, FL, paper ThQ4.

B. Rouse and D. C. Kilper, “Fundamental optical noise limits on semiconductor laser based interferometers,” OPTO-Southeast, SPIE, Charlotte NC, 2000.

D. C. Kilper, P. Dupriez, and V. Cardon, “Optical feedback and coupling characteristics of microsphere resonators,” OPTO-Southeast, SPIE, Charlotte, NC, 2000.

K. Croussore, M. Baker, E. Rowell, and D. C. Kilper, “Noise Performance of Erbium/Ytterbium Co-Doped Fiber Lasers,” OPTO-Southeast, SPIE, Charlotte, NC, 2000.

R. Gabet, F. Lissillour, D. Messager, P. Besnard, P. Feron, G. Stephan, and D. Kilper, “Linewidth measurement of microsphere lasers using an injected, frequency-locked semiconductor laser,” LASER Conference, Quebec, Canada, December, 1999.

B. Rouse, D. C. Kilper, and K. L. Lear, “Polarization fluctuations in oxide-confined vertical cavity lasers,” Optical Technology in the Carolinas Conference, Charlotte, NC, 1999.

B. Rouse, D. C. Kilper, and K. L. Lear, “Influence of polarization fluctuations on quantum noise reduction in oxide-confined vertical cavity lasers,” OSA Annual Meeting, Baltimore, MD, 1998.

G. D. Dorazio, G. H. Cooper, M. Y. A. Raja, D. C. Kilper, and K. L. Lear, “Polarization behavior of ion-implanted and oxide-confined VCSELs,” OSA Annual Meeting, Baltimore, MD, 1998.

D. C. Kilper, P. A. Roos, J. L. Carlsten, A. C. Schaefer, and D. G. Steel, "Quantum polarization dynamics in semiconductor lasers," Conference on Polarization Effects in Lasers and Spectroscopy, Toronto, May 1997.

D. C. Kilper, P. A. Roos, and J. L. Carlsten, "Nonclassical Fields in Microcavity Lasers", Conference on Quantum Coherence and Decoherence, Institute for Theoretical Physics, UCSB, December 1996.

D. C. Kilper, "Quantum Noise in Semiconductor Laser Systems", Optical Science and Laser Technology Conference, Bozeman, MT, September 1996.

A. C. Schaefer, D. C. Kilper, J. Erland, and D. G. Steel, "Nonlinear optical spectroscopy using photon-number squeezed light and the investigation of excitation-induced noise," DAMOP, Ann Arbor, MI, May 1996.

D. C. Kilper, S. B. Dierker, "Static and dynamic behavior of the binary mixture cyclohexane and methanol in porous media," APS Division of Condensed Matter March Meeting, Pittsburgh, March 1994.

D. C. Kilper, S. B. Dierker, "Structure factor of binary fluids in porous media," APS Division of Condensed Matter March Meeting, Seattle, March 1993.

J. Wellman, D. C. Kilper, D. Bartlett, S. B. Dierker and R. Clarke, "Brillouin light scattering study of magnons in Co/Cu superlattices," APS Division of Condensed Matter March Meeting, Seattle, March 1993.

R. S. Conti, P. H. Bucksbaum, D. C. Kilper, D. Jenkins, "New tests of P-conserving T-violation in atoms," DAMOP, 1991.