Ian B. Burgess

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QUALIFICATIONS SUMMARY

- 8 years of experience in interdisciplinary research and technology development, spanning the areas of nanoscale photonics, materials chemistry, soft-matter physics, nonlinear optics
- Proficient in the design and execution of both experimental and theoretical research projects
- Inventor and lead developer of a 2013 R&D 100 Award-winning technology (W-Ink)
- Experienced in recruiting and managing a research team
- Research results highlighted in prominent scientific media, including *Scientific American, Chemical & Engineering News,* and *Nature Photonics*
- Co-author of 6 patents, 24 academic publications, and over 30 conference presentations
- Exemplary communication skills as demonstrated through 11 invited talks including a keynote lecture at McMaster University's 1st Annual Integrated Science Symposium
- Firsthand experience drafting US patent and PCT applications
- Software: MS Office, LaTeX, MATLAB, Maple, Lumerical FDTD Solutions, AutoCAD
- Experimental techniques: polymer/sol-gel materials and nanoparticle synthesis, e-beam lithography, UV lithography, RIE, PECVD, soft lithography, SEM, ellipsometry, goniometry, nanoscale optical spectroscopy
- **Fluent in English and French, Canadian citizen**

EDUCATION

PhD, Applied Physics,
Harvard University, Cambridge, MA, USA **2012**
Thesis: *Wetting in Color*

BSc, Mathematical Physics, Minor in Chemistry,
University of Waterloo, Waterloo, ON, Canada **2008**

AWARDS

- **Banting Postdoctoral Fellowship** – NSERC (Canada), 2014-
- **R&D 100 Award (Invention: W-Ink)** – R&D Magazine, 2013
- **Wyss Institute Technology Development Fellowship** – Harvard University 2012-2014
- **3rd Place, Best Student Poster Presentation Award** – PECS-X Conference, Santa Fe, NM, June 2012.
- **Delegate at the 60th Annual Meeting of the Nobel Laureates in Lindau, Germany (3rd Interdisciplinary Meeting),** 2010 - sponsored by NSERC (Canada) and Microsoft Corporation
- **One of 50 delegates of the Meeting of the Nobel Laureates to receive the Robert Bosch Stitftung GmBh Fellowship to attend Euroscience Open Forum in Torino, Italy** 2010
- **NSERC (Government of Canada) Postgraduate scholarship - Doctoral (PGS-D)** 2009 – 2012– **Masters (PGS-M)** 2008 – 2009
- **NSERC Alexander Graham Bell Canada Graduate Scholarship (tenable only in Canada, declined)** 2008
- **Three-time recipient of an NSERC Undergraduate Student Research Award (USRA)**

(2005, 2007, 2008)
- **University of Waterloo Department of Physics Sir Isaac Newton Scholarship**, 2008
- **Honorable Mention** – for Best Talk at Southern Ontario Undergraduate Student Chemistry Conference, 2006
- **University of Waterloo Faculty of Science Entrance Scholarship,** 2004

RESEARCH EXPERIENCE

Banting Postdoctoral Fellow (Adv.: Profs. Shana Kelley and Ted Sargent)
Leslie Dan Faculty of Pharmacy, University of Toronto
Toronto, ON, Canada **2014 - present**
- Manages a multimillion dollar initiative within the Kelley and Sargent groups aimed at the development of rapid, portable, low-cost diagnostics for infectious diseases

Wyss Technology Development Fellow (Adv.: Prof. Joanna Aizenberg)
Wyss Institute for Biologically Inspired Engineering, Harvard University
Cambridge, MA, USA **2012 - 2014**
- Recruited and managed a team of 6 researchers developing bioinspired adaptive optical materials for application in colorants, sensing and camouflage
- Solicited and supported large research partnerships with industry (BASF) and government (US Department of Defense, US Department of Transportation)
- Developed commercialization strategies for these technologies with business development specialists, wrote and filed patents with support from a leading IP firm.

Graduate Research Assistant (Adv.: Profs. Marko Lončar and Joanna Aizenberg)
Laboratory for Nanoscale Optics, Harvard University, Cambridge, MA, USA **2008-2012**
- Developed a low-cost colorimetric platform for identification of organic liquids based on patterned surface functionalization in silica inverse opals assembled from a polymer template
- Fabricated and characterized high-Q/V nanoscale photonic-crystal resonators in a low refractive index all-polymer platform
- Developed hybrid top-down/bottom-up nanofabrication techniques to build sol-gel superlattices with structural hierarchy
- Designed efficient sources of terahertz radiation based on coupled photonic crystal cavities

Research Assistant (Adv.: Prof. Roberto Morandotti)
INRS-EMT, Varennes, QC, Canada **2008**
- Analytically and numerically modeled optical pulse propagation under the influence of two decoupled nonlinear effects in a nematic liquid crystal
- Numerically modeled nonlinear optical effects in an integrated low-loss high-index silica-on-silicon waveguide (collaboration with Infinera Co.)

Research Assistant (Adv.: Prof. Kalai Saravanamuttu)
Department of Chemistry, McMaster University, Hamilton, ON **2005-2007**
- Characterized spontaneous optical pattern formation in the photopolymerization of an organosiloxane
- Designed and conducted an experiment studying the simultaneous modulation instability of two intersecting beams of white light in a photochemical medium

CONFERENCE CHAIR

- Co-organizer and co-chair of the “Surface Chemistry of Soft Materials and Photonics” symposium at the 2014 Canadian Chemistry Conference & Exhibition (Vancouver BC), June 1-5 , 2014.
- Co-organizer and co-chair of the “Workshop on Structural Color” at Harvard University, May 21 2014.
- Session Chair in the “Novel Phenomena and Devices in Photonic Crystals II” session at SPIE Photonics West in 2013 (San Francisco, CA)

TEACHING EXPERIENCE:

Teaching Fellow/Teaching Assistant:
School of Engineering and Applied Sciences, Harvard University

- Ordinary and Partial Differential Equations (2010); Optics and Photonics (2010, 2011)

Department of Physics, University of Waterloo - January-April 2008

- Physics 111/112/122: Mechanics and Waves

Tutoring:
Harvard University Bureau of Study Council Sept. 2009-2010

- Mechanics, Upper year Quantum Mechanics, Vector calculus, and linear algebra

Chemistry Club, University of Waterloo, September-December 2007

- Mathematical Methods for Chemistry, Thermodynamics, Quantum Mechanics

Mentoring and Research Supervision:

- Founded and managed a research internship program at the Wyss Institute at Harvard University for Canadian undergraduate students. To date, 28 students have been recruited through the program.
- Directly supervised the research of 3 graduate students, 2 research associates, and 13 undergraduate students.

Outreach:

- Developed and showcased an educational exhibit on structural color and surface tension for NanoDays at the Museum of Science in Boston. Our exhibit remains on permanent display throughout the year.
- Gave two guest lectures on interdisciplinary research and education to undergraduate students in McMaster University’s Integrated Science (iSci) program
- Co-developer of a workshop on STEM career development for high school students, entitled “Applying Physics Principles to Build a Career Roadmap,” presented at the 2014 Ontario Association of Physics Teachers Conference in May 2014

PEER REVIEWER

- Referee for Optics Letters, Optics Express, Advanced Materials, Advanced Functional Materials, Applied Physics Letters, Applied Optics, Nanoscale, Chemistry of Materials
- International reviewer for the Romanian National Research Council grant proposals

ACTIVITIES AND INTERESTS

- Enthusiast of hockey and golf, and competitive long driver (golf). Qualified for the REMAX World Long Drive Championship Regional finals for New York and New England in 2013.

PATENTS

P6) J. Aizenberg, **I.B. Burgess,** C. Shillingford, "Tamper- indicating device," US Provisional Patent Application, US Serial No 62/015,606 (filed 2014).

P5) J. Aizenberg, **I.B. Burgess**, M. Duffy, T.M. Kay, N. Koay, "Colorimetric sensor with automated readout" US Provisional Patent Application, US Serial No 61/977,728 (filed 2014).

P4) J. Aizenberg, **I.B. Burgess**, N. Koay, M. Kolle, K.R. Phillips, T. Shirman, S. Utech, N. Vogel, "Structurally Colored Materials and Methods for Making the Same," US Provisional Patent Application, US Serial No. 61/860,694 (filed 2013).

P3) M.A. Brook, **I.B. Burgess**, M.R. Ponte, K. Saravanamuttu, "Functional Microstructures and All-Optical Encoding of Light Beams" US Provisional Patent Application, US Serial No 61/771,324 (filed 2013)

P2) J. Aizenberg, **I.B. Burgess**, B.D. Hatton, M. Lončar, L. Mishchenko, "Manipulation of fluids in three-dimensional porous photonic structures with patterned surface properties," PCT Application, WO 2,012,078,351 (filed 2010).

P1) J. Bravo-Abad, **I.B. Burgess**, J.D. Joannopoulos, S.G. Johnson, M. Lončar, M.W. McCutcheon, A.W. Rodriguez, M. Soljačić, Y. Zhang "Efficient terahertz sources based on difference-frequency generation in triply-resonant photonic resonators", U.S. Patent No. 8,285,091 (filed 2009, issued 2012).

PUBLICATIONS

(* equal contribution, § corresponding author)

25) N. Koay, **I.B. Burgess**§, T.M. Kay, B.A. Nerger, M. Miles-Rossouw, T. Shirman, T.L. Vu, G. England, K.R. Phillips, S. Utech, N. Vogel, M. Kolle, J. Aizenberg§, "Hierarchical structural control of visual properties in self-assembled photonic-plasmonic pigments," *Optics Express,* in press (arXiv: 1406.7333) (2014).

24) K.R. Phillips, N. Vogel, **I.B. Burgess**, C.C. Perry, J. Aizenberg§, "Directional Wetting in Anisotropic Inverse Opals," *Langmuir*, 30, 7615-7620 (2014).

23) T.A. Singleton, **I.B. Burgess**§, B.A. Nerger, A. Goulet-Hanssens, N. Koay, C.J. Barrett, J. Aizenberg, "Photo-tuning of highly selective wetting in inverse opals," *Soft Matter*, 10, 1325-1328 (2014).

22) Q. Quan, D.L. Floyd, **I.B. Burgess**, P.B. Deotare, I.W. Frank, S.K.Y. Tang, R. Ilic, F. Vollmer, M. Lončar§, "Single Particle Detection in CMOS Compatible Photonic Crystal Nanobeam Cavities," *Optics Express,* 21, 32225-32233 (2013).

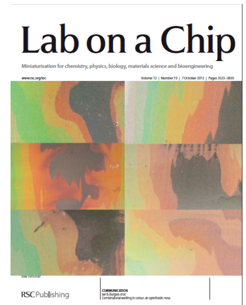
21) **I.B. Burgess**§, M. Lončar, J. Aizenberg, "Structural Colour in Colourimetric Sensors and Indicators," *Journal of Materials Chemistry C,* 1, 6075-6086 (2013).

20) **I.B. Burgess**§, J. Aizenberg, M. Lončar, "Creating bio-inspired hierarchical 3D-2D photonic stacks via planar lithography on self-assembled inverse opals," *Bioinspiration and Biomimetics* 8, 045004 (2013) [Invited].

19) **I.B. Burgess**§, B.A. Nerger, K.P. Raymond, A. Goulet-Hanssens, T.A. Singleton, M.H. Kinney, A.V. Shneidman, N. Koay, C.J. Barrett, M. Lončar, J. Aizenberg, "Wetting in Color: From photonic fingerprinting of liquids to optical control of liquid percolation," *Proceedings of SPIE* **8632**, 8632-1

(2013) [Invited].

18) W.D. Wang, **I.B. Burgess**, B.D. Hatton, J. Alvarenga, J. Aizenberg[§], "Secrets Revealed: Spatially Selective Wetting of Plasma-Patterned Periodic Mesoporous Organosilica," *Canadian Journal of Chemistry,* 90, 1063-1068 (2012) [Invited paper for focus issue in honor of Prof. Geoffrey A. Ozin].



17) K.P. Raymond[*], **I.B. Burgess**[*§], M.H. Kinney[*], M. Lončar, J. Aizenberg, "Combinatorial Wetting in Colour: An Optofluidic Nose," *Lab on a Chip* **12**, 3666-3669 (2012). ***Featured on the inside cover and in Nature Photonics Research Highlights, vol. 6, 501 (2012).***

16) C.E. Liekhus-Schmaltz, R. Mantifel, M. Torabifard, **I.B. Burgess**, J.D.D. Martin[§], "Injection-locked diode laser current modulation for Pound-Drever-Hall frequency stabilization using transfer cavities," *Journal of the Optical Society of America B* **29**, 1394-1398 (2012).

15) **I.B. Burgess**[§], N. Koay[*], K.P. Raymond[*], M. Kolle, M. Lončar, J. Aizenberg[§], "Wetting in Color: Colorimetric Differentiation of Organic Liquids with High Selectivity," *ACS Nano* **6**, 1427-1437 (2012). ***Highlighted in "In Nano" ACS Nano, 6, 990–992 (2012).***

14) J.T. Choy, J.D.B. Bradley, P.B. Deotare, **I.B. Burgess**, C.C. Evans, E. Mazur, M. Lončar[§], "Integrated TiO_2 resonators for visible photonics," *Optics Letters* **37**, 539-541 (2012).

13) Q. Quan, **I.B. Burgess**, S.K.Y. Tang, D.L. Floyd, M. Lončar[§], "High-Q, low index-contrast polymeric photonic crystal nanobeam cavities," *Optics Express* **19**, 22191-22197 (2011).

12) **I.B. Burgess**[§], L. Mishchenko, B.D. Hatton, M. Kolle, M. Lončar, J. Aizenberg[§], "Encoding complex wettability patterns in chemically functionalized 3D photonic crystals," *Journal of the American Chemical Society* **133**, 12430-12432 (2011). ***This paper received significant media coverage including: Harvard Gazette, Chemical and Engineering News, Chemistry World (RSC), Discover Magazine, Scientific American, AIP Discoveries and Breakthroughs, ASIS-TV, Materials Today, The Engineer (UK), Gizmag, Popular Mechanics (SA), Cosmetics & Toiletries***

11) L. Mishchenko, B.D. Hatton, **I.B. Burgess**, S. Davis, K. Sandhage, J. Aizenberg[§], "Colloidal co-assembly route to large-area, high-quality photonic crystals," *Proceedings of SPIE* **7946**, 7946-19 (2011) [Invited].

10) M. Peccianti[§], **I.B. Burgess**, G. Assanto, R. Morandotti, "Space-time bullet trains via modulation instability and nonlocal solitons," *Optics Express* **18**, 5934-5941 (2010).

9) **I.B. Burgess**[*], Y. Zhang[*], M.W. McCutcheon[*], A.W. Rodriguez, J. Bravo-Abad, S.G. Johnson, M. Lončar[§], "Design of an efficient terahertz source using triply resonant nonlinear photonic crystal cavities," *Optics Express* **17**, 20099-20108 (2009).

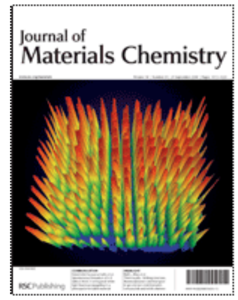
8) Y. Zhang[§], M.W. McCutcheon, **I.B. Burgess**, M. Lončar, "Ultra-high-Q TE/TM dual-polarized photonic crystal nanocavities," *Optics Letters* **34**, 2694-2696 (2009). ***Selected for the September 28, 2009 issue of Virtual Journal of Nanoscale Science & Technology***.

7) **I.B. Burgess**[§], A.W. Rodriguez, M.W. McCutcheon, J. Bravo-Abad, Y. Zhang, S.G. Johnson, M. Lončar, "Difference-frequency generation with quantum-limited efficiency in triply-resonant nonlinear cavities," *Optics Express* **17**, 9241-9251(2009).

6) **I.B. Burgess**, M. Peccianti[§], G. Assanto, R. Morandotti, "Accessible Light Bullets via Synergetic Nonlinearities," *Physical Review Letters* **102**, 203903 (2009).

5) **I.B. Burgess**, Book recommendation in: "Pages to Turn on a Lazy Day," *Science* **325**, 1267-1269 (2009).

4) **I.B. Burgess**, M.R. Ponte, K. Saravanamuttu[§], "Spontaneous formation of 3-D optical and structural lattices from two orthogonal and mutually incoherent beams of white light propagating in a photopolymerisable material," *Journal of Materials Chemistry* **18**, 4133-4139 (2008). ***Featured on the front cover and top 10 most downloaded articles for Sept. 2008***.



3) **I.B. Burgess**, P. Rochon, N. Cunningham[§], "Photophysical Properties of Commercial Red Dyes in Polymer Films," *Optical Materials* **30**, 1478-1483 (2008).

2) **I.B. Burgess**, "The Electric Quadrupole and NMR," *Phys13 News* **124**, 8 (2007). [Educational Material]

1) **I.B. Burgess**, W.E. Shimmell, K. Saravanamuttu[§], "Spontaneous Pattern Formation Due to Modulation Instability of Incoherent White Light in a Photopolymerizable Medium," *Journal of the American Chemical Society* **129**, 4738-4746 (2007).

INVITED TALKS

11) C. Burgess, **I. Burgess**, "Applying Physics Principles to Build a Career Roadmap," workshop at the Ontario Association of Physics Teachers Conference, hosted by the Department of Electrical And Computer Engineering, University of Toronto (May 8-10, 2014)

10) **I.B. Burgess, "**Tunable wetting and color in porous 3D photonic crystals," 2^{nd} International Conference on Small Science (Las Vegas, NV, Dec. 18 2013).

9) **I.B. Burgess,** "Wetting in Color," Research seminar at BASF Corporation, (Tarrytown, NY, July 31^{st}, 2013).

8) **I.B. Burgess**, "Squishy solutions to hard problems: Traditional nanophotonics takes lessons form nature", seminar at McGill University, jointly hosted by the departments of Chemical Engineering and Bioengineering (Montreal, QC, Canada, Feb. 12, 2013).

7) **I.B. Burgess**, B.A. Nerger, K.P. Raymond, A. Goulet-Hanssens, T.A. Singleton, M.H. Kinney, A.V. Shneidman, N. Koay, C.J. Barrett, M. Lončar and J. Aizenberg, "Wetting in Color: From photonic fingerprinting of liquids to optical control of liquid percolation," SPIE Photonics West (San Francisco, CA, Feb. 2-7 2013).

6) **I.B. Burgess**, "Chemically specific colorimetric indicators based on wetting in 3D photonic crystals," Chemistry & Chemical Biology departmental seminar at McMaster University (Hamilton, ON, Canada, January 14, 2013).

5) **I.B. Burgess**, "Squishy Solutions to Hard Problems," seminar at the University of Waterloo, jointly hosted by the department of Chemistry and the Institute for Quantum Computing (Waterloo, ON, Canada, December 20, 2012).

4) **I.B. Burgess**, "Innovation in the cracks between disciplines: The journey from undergraduate education to interdisciplinary research," 1^{st} Annual Integrated Science Symposium - Synthesis, (McMaster University, Hamilton, ON, Canada, March 29, 2012) ***(Keynote lecture)***

3) **I.B. Burgess**, "W-Ink: A Platform for Colorimetric Liquid Identification, Authentication, and Multilevel Encryption," Wyss Institute 3^{rd} Annual Retreat (Boston, MA, Nov. 21, 2011)

2) **I.B. Burgess**, "My path to interdisciplinary research," Invited guest lecture, 2^{nd} year Thermodynamics Module, Integrated Science (iSci) program, McMaster University (Hamilton, ON, Canada, Oct. 25, 2011).

1) **I.B. Burgess**, "Wetting in Color: Fingerprinting fluids in chemically encoded 3D photonic

crystals," Brockhouse Institute for Material Research Seminar, McMaster University (Hamilton, ON, Canada, Oct. 24, 2011).

PRESENTATIONS AND PROCEEDINGS

39) **I.B. Burgess**, N. Abedzadeh, D.J. Cranshaw, A.V. Shneidman, T.M. Kay, M. Loncar, J. Aizenberg, "Percolation Lithography: Self-assembly of 3D photonic Structures with Controlled Aperiodicity," 97th Canadian Chemistry Conference and Exhibition, paper #01886, Vancouver, BC, Canada, June 4, 2014.

38) N. Koay, **I.B. Burgess**, T.M. Kay, B.A. Nerger, M. Miles-Rossouw, M. Kolle, T. Shirman, N. Vogel, K.R. Phillips, T.L. Vu, S. Utech, J. Aizenberg, "One-pot Synthesis of Hierarchical Structural Color Pigments with Independent Control of Absorption and Scattering," 97th Canadian Chemistry Conference and Exhibition, paper #00548, Vancouver, BC, Canada, June 2, 2014 [poster].

37) **I.B. Burgess**, N. Abedzadeh, D.J. Cranshaw, T.M. Kay, A.V. Shneidman, M. Loncar, J. Aizenberg, "Percolation Lithography," Workshop on Structural Color, Harvard University, May 21, 2014.

36) N. Koay, B.A. Nerger, M. Miles-Rossouw, **I.B. Burgess**, T. Shirman, M. Kolle, J. Aizenberg, "Multifunctional Colorants based on Combined Plasmonic and Photonic Effects", MRS Fall Meeting (Boston, MA, Dec. 4, 2013) [poster].

35) T.A. Singleton, A. Goulet-Hanssens, C.J. Barrett, **I.B. Burgess**, J. Aizenberg, B.A. Nerger, N. Koay, A.S. Chan, "Dynamic, Photo-tunable Wetting in Inverse Opal Structures for Colorimetric Sensing and Tunable Fluidics", Canadian Chemistry Conference and Exhibition, (2013, Québec City, Canada).

34) B.A. Nerger, A.S. Chan, **I.B. Burgess**, N. Koay, M.H. Kinney, K.P. Raymond, J. Aizenberg, "Combinatorial Optofluidic Sensing using Colourimetric Sensor Arrays", Canadian Chemistry Conference and Exhibition, (2013, Québec City, Canada).

33) A.S. Chan, B.A. Nerger, M.H. Kinney, K.P. Raymond, **I.B. Burgess**, N. Koay, J. Aizenberg, "Combinatorial Colourimetric Sensing: Multidimensional Differentiation of Organic Liquids", Southern Ontario Undergraduate Student Chemistry Conference, (2013, Hamilton, Canada).

32) B.A. Nerger, **I.B. Burgess**, T.A. Singleton, A. Goulet-Hanssens, N. Koay, C.J. Barrett, J. Aizenberg, "Dynamic Wetting and Colour in Photoresponsive Inverse Opal Films", Southern Ontario Undergraduate Student Chemistry Conference, (2013, Hamilton, ON).

31) K.R. Phillips, **I.B. Burgess**, N. Vogel, J. Aizenberg, "Pore Size and Anisotropy Effects in Wetting in Color," MRS Fall Meeting (Boston, MA, Nov. 28, 2012) [poster]

30) **I.B. Burgess**, A.V. Shneidman, K.P. Raymond, N. Koay, M. Kinney, M. Kolle, J. Aizenberg, M. Lončar, "Wetting in Color," PECS-X, paper #107 (Santa Fe, NM, June 4, 2012) [poster].

29) **I.B. Burgess**, K.P. Raymond, M.H. Kinney, N. Koay, A.V. Shneidman, M. Kolle, M. Lončar, J. Aizenberg, "Colorimetry for Organic Liquid Identification," 95^{th} Canadian Chemistry Conference and Exhibition, paper #1932 (Calgary, AB, Canada, May 30, 2012)

28) Q. Quan, **I.B. Burgess**, S.K.Y. Tang, D.L. Floyd, M. Lončar, "High-Q, Low Index-Contrast

Polymeric Photonic Crystal Nanobeam Cavities," CLEO/QELS, paper # QF2D.7 (San Jose, CA, May 11, 2012).

27) A.V. Shneidman, **I.B. Burgess**, M. Kolle, Q. Quan, J. Aizenberg, M. Lončar, "Bio-inspired tunable disorder in a 3D photonic crystal via highly controlled partial wetting and drying," CLEO/QELS, paper QF2H.5 (San Jose, CA, May 11, 2012).

26) **I.B. Burgess**, K.P. Raymond, N. Koay, A.V. Shneidman, M. Kolle, M. Lončar, J. Aizenebrg, "Highly selective colorimetric differentiation of organic liquids in 3D photonic crystals," CLEO/QELS, paper CW1G.8 (San Jose, CA, May 9, 2012).

25) **I.B. Burgess**, K.P. Raymond, N. Koay, A. Shneidman, M. Kolle, M. Lončar, J. Aizenberg, "Wetting as a basis for a highly selective colorimetric indicator for organic liquids," APS March Meeting, paper X50.00013 (Boston, MA, Mar. 1, 2012)

24) K.P. Raymond, **I.B. Burgess**, N. Koay, M. Kolle, M. Lončar, J. Aizenberg, "Wetting in Color: Designing a colorometric indicator for wettability," APS March Meeting, paper B37.00002 (SPS Undergraduate Research Symposium, Feb. 27, 2012, Boston, MA).

23) **I.B. Burgess,** "Fingerprinting organic liquids in chemically encoded 3D photonic crystals," Department of Chemistry Student and Post-Doc seminar series, Harvard University (Dec. 2, 2011).

22) **I.B. Burgess**, K.P. Raymond, N. Koay, M. Kolle, L. Mishchenko, B.D. Hatton, M. Lončar, J. Aizenberg, "Wetting in Color: Chemically encoded 3D photonic crystals as a multilevel encryption scheme and a colorimetric indicator for organic liquids," Materials Science Seminar, Harvard University (MA, July 2011).

21) **I.B. Burgess**, L. Mishchenko, B.D. Hatton, M. Kolle, M. Lončar, J. Aizenberg, "Multilevel chemical encryption in 3D photonic crystals," 85th ACS Colloid and Surfaces Symposium (Montreal, Canada, June 19-22, 2011).

20) **I.B. Burgess**, M. Lončar, and J. Aizenberg, "Chemically Encoded 3D Photonic Crystals: From Multilevel Encryption to Colorimetric Fluid Identification," TechConnect World 2011, Boston, MA, June 13th-16th, 2011 [poster]

19) **I.B. Burgess**, L. Mishchenko, B.D. Hatton, M. Kolle, M. Lončar, J. Aizenberg, "3D photonic crystals with patterned surface chemistry: from multilevel encryption to simple diagnostics," 94th Canadian Chemistry Conference and Exhibition (Montreal, Canada, June, 8 2011).

18) **I.B. Burgess**, M. Kolle, L. Mishchenko, B.D. Hatton, M. Lončar, J. Aizenberg, "An optical indicator for organic liquids based on patterned wettability in 3D photonic crystals," 94th Canadian Chemistry Conference and Exhibition (Montreal, Canada, June 2011). [poster]

17) Q. Quan, **I.B. Burgess**, P.B. Deotare, I.W. Frank, S.K.Y. Tang, R. Illic, F. Vollmer, M. Lončar, "Ultrasensitive On-Chip Photonic Crystal Nanobeam Sensor using Optical Bistability," Conference on Lasers and Electro-Optics), paper QThH6 (Baltimore, MD, May 2011.

16) **I.B. Burgess**, L. Mishchenko, B.D. Hatton, M. Kolle, M. Lončar, J. Aizenberg, "Encrypting messages in 3D photonic crystals with patterned surface chemistry," Conference on Lasers and Electro-Optics, paper CMEE2 (Baltimore, MD, May 2011).

15) **I.B. Burgess**, Y. Zhang, B.D. Hatton, J. Aizenberg, M. Lončar, “On-substrate photonic-crystal nanobeam cavities in electron-beam resist,” SPIE Photonics West, (January 2011, San Francisco, CA).

14) L. Mishchenko, B.D. Hatton, **I.B. Burgess**, S. Davis, K. Sandhage, J. Aizenberg, “Colloidal co-assembly route to large-area, high-quality photonic crystals,” SPIE Photonics West, (January 2011, San Francisco, CA). [invited talk]

13) **I.B. Burgess**, L. Mishchenko, B.D. Hatton, M. Kolle, M. Lončar, J. Aizenberg, “Multilevel encoding of wettability in 3D photonic crystals,” seminar at the Department of Applied Physics, Stanford University, January 2011.

12) **I.B. Burgess**, L. Mishchenko, B.D. Hatton, M. Kolle, M. Lončar, J. Aizenberg, "Watermark-Ink (W-Ink): Selective wetting in 3D photonic crystals with patterned surface chemistry" Advanced Energy Consortium (AEC) 2010 project review, Dec. 7-9 Austin, TX (poster).

11) M. Peccianti, **I.B. Burgess**, G. Assanto, R. Morandotti, "Optical Bullet Trains via Modulation Instability in Nonlocal Solitons," Quantum Electronics and Laser Science Conference (2010, San Jose, CA), paper QTuC4.

10) M. Peccianti, D. Duchesne, M. Ferrera, **I.B. Burgess**, L. Razzari, R. Morandotti, B.E. Little, S.T. Chu, D.J. Moss, "Nonlinear Pulse Processing in High-Index Glass Integrated Devices: Pulse Compression," Optical Fiber Communication Conference (2010, San Diego, CA), paper JWA27.

9) M. Peccianti, **I.B. Burgess**, G. Assanto, R. Morandotti, “Generation of Bullet Trains via Temporal Modulation Instability in Nonlocal Solitons,” Nonlinear Photonics (2010, Karlsruhe, Germany), paper NME12.

8) M. Peccianti, M. Ferrera, D. Duchesne, L. Razzari, **I.B. Burgess**, R. Morandotti, B.E. Little, S.T. Chu, D.J. Moss, “Temporal pulse compression in low dispersion Hydex glass integrated waveguides,” 22nd IEEE LEOS Annual Meeting (2009, Belek-Antalya, Turkey), DOI: 10.1109/LEOS.2009.5343137.

7) **I.B. Burgess**, M.W. McCutcheon, A.W. Rodriguez, J. Bravo-Abad, Y. Zhang, S.G. Johnson, M. Lončar, “Efficient Difference Frequency Generation in Triply Resonant Nonlinear Cavities,” in Nonlinear Optics: Materials, Fundamentals and Applications, (2009, Honolulu, HI), paper NWD2.

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