

Aaron D. Slepko

Physics & Astronomy
Trent University
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Academic Employment

Department Chair Physics & Astronomy, Trent University	2020-present
Full Professor Department of Physics & Astronomy, Trent University	2022-present
Associate Professor Department of Physics & Astronomy, Trent University	2016-2022
Assistant Professor Department of Physics & Astronomy, Trent University	2011-2016
Research Associate (post-doc) Albert Stolow's research group Steacie Institute for Molecular Science, National Research Council of Canada (NRC), Ottawa	2009-2011
NSERC Post-Doctoral Fellow Alexander Gaeta's research group, School of Applied and Engineering Physics, Cornell University	2006-2009
Research Assistant Frank Hegmann and Rik Tykwinski research groups Departments of Physics and Chemistry, University of Alberta	1999-2006
Faculty Instructor Department of Physics, Grant MacEwan University	2002

Professional Honours

Trent University Educational Leadership and Innovation Award	2021
Canada Research Chair (Tier II) in the Physics of Biomaterials	2011–2021
Trent University Merit Award for Research Excellence	2017
NSERC Post-Doctoral Fellowship	2006–2008

Education

Ph.D. in physics , University of Alberta,	2006
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Focus: Ultrafast optical nonlinearities of organic chromophores
Thesis: *"Ultrafast third-order optical nonlinearities of conjugated organic molecules"*

M.Sc. in physics, University of Alberta, 2001

Focus: Ultrafast laser spectroscopy; optical nonlinearities
Thesis: *"Third-order nonlinearities of novel iso-polydiacetylenes studied by a differential optical Kerr effect detection technique"*

Hon. B.Sc. in physics and chemistry, Brock University, 1999

Focus: Far infrared reflectance spectroscopy of semiconductors
Thesis: *"Far-infrared polarized reflectance measurements of the vacancy doped perovskite $Sm_{0.95}TiO_3$ "*

Forms of Scholarly Contributions (publications and presentations see APPENDIX A)

Research Grants

Government or extra-university

1. Canadian Foundation for Innovation John R. Evans Leaders Fund (JELF +ORF)
"Laser source for label-free nonlinear imaging of biomaterials"
\$450,000; 2019
2. NSERC Discovery Grant
"Development and applications of integrated nonlinear imaging tools"
\$140,000 over 5 years (\$28,000/year); 2018-2023
3. Canada Research Chair (Tier II); Renewal
"The physics of Biomaterials"
\$500,000 over 5 years; 2016-2020
4. Canadian Foundation for Innovation Leaders' Opportunity Fund (CFI-LOF+ORF)
"Laboratory for Non-Linear Optical Characterization of Biomaterials"
\$250,000; 2012
5. NSERC Discovery Grant
"Multimodal Nonlinear Optical Characterization of Biomaterials"
\$222,000 over 6 years (\$37,000/year); 2012-2018
6. Canada Research Chair (Tier II)
"The physics of Biomaterials"
\$500,000 over 5 years; 2011-2016
7. NSERC Postdoctoral Fellowship (PDF)
"Ultrafast High-Intensity Light-Matter Interactions in Organic Materials"
\$80,000 over two years; 2006-2008

University

1. Start-Up funds

“Biomaterials Characterization and Imaging Research at Trent”
\$20,000; 2011

2. Learning Innovations Grant from the Instructional Development Centre
“Applying the Instant Feedback Assessment Technique to an Introductory Physics course”
\$4,000; 2012 (Co-applicant: Ralph Shiell)

Service to the Profession

Reviewed Application for a named professorship at a Canadian University, 2022.

Reviewed NSERC i2i grant, June 2022.

Reviewed CFI JELF grant, July 2021.

Reviewed NSERC Discovery Grants, 2018, 2021.

Reviewed 2 Canada Research Chair nominations (U Ottawa); 2013, 2019.

Reviewed STLHE conference presentation proposals, 2015-2017.

Member of the Program Committee for the 15th international joint conference on biomedical engineering systems and technologies (BIOSTEC 22), February 2022.

Organized conference sessions on coherent anti-Stokes Raman scattering (CARS) for the Physics of Quantum Electronics (PQE-2011) conference, Snowbird, Utah, Jan 2011.

Conference session chairing:

1. Session chair of Nanophotonics session, Photonics North (Virtual), May 31-June 02, 2021.
2. Consulting on the makeup of the organizing committee of the 1st Canadian Online Photonics Meetup (Can POM), 2020.
3. Co-chair of the Biophotonics track sessions at Photonics North 2018, June 5-7, 2018, Montreal.

Refereed (peer-reviewer) at the following journals:

PNAS, *Optics Express*, *Optics Letters*, *Optics Continuum*, *PLoS ONE*, *Biomedical Optics Express*, *AIP Advances*, *Applied Spectroscopy*, *Applied Optics*, *Physical Reviews Applied*, *Applied Physics Letters*, *Photonics*, *Journal of Chemical Physics*, *Journal of Biophotonics*, *Journal of Biomedical Optics*, *Synthetic Metals*, *Carbohydrate Polymers*, *Photochemical and Photobiological Sciences*, *the Journal of Applied Polymer Science*, *Journal of Educational Measurement*, *SAGE Open*, *Physical Reviews Special Topics (PRST-PER)*, *Interactive Learning Environments*, *Chemistry Education Research & Practice*, *The Physics Teacher*, and *the American Journal of Physics*.

Trent **Liaison** to the Ontario Assoc. of Physics Teachers (OAPT) 2001–current
Trent **Representative** Member to CMC microsystems 2015–current

Academic Responsibilities

Undergraduate courses taught

PHYS-2250H: Electronics
PHYS-4240H: Modern Optics
PHYS-4220H: Electricity and Magnetism Theory
PHYS-1002H: Introductory Physics II—Electricity and Magnetism
PHYS-1060H: Physics for the Life Sciences

Graduate courses taught

MTSC-6140H: Experimental Techniques in Materials Science
MTSC-6000H: Scientific Communication

Student Supervision

Current:

Yuchen Song, PhD In Materials Science,	2020–present
John Shafe-Purcell, MSc in Materials Science,	2021–present
Shima Nikkah Fini, MSc in Materials Science,	2021–present
George Olaniyan, MSc in Materials Science,	2020–present

Past:

Ryan Cole, PhD Materials Science,	2014–2021
Jeremy Porquez, PhD Materials Science,	2015-2019
Joel Tabarangao, PhD Materials Science (ABD),	2014-2020
Joel Tabarangao, M.Sc. Materials Science,	2012-2014

Undergraduate

John Shafe-Purcell, Summer 2021
Miao Hu, Summer 2019, Honours thesis, 2020
Hamza Khattak, USRA summer 2017, Honours thesis 2018
Melissa Van Bussel, USRA summers 2018, 2019 (with Prof. W. Burr)
Kara Fitze, USRA summer 2018 (with Prof. W. Burr)
Rodion Gordzevich, summer 2017
Alan Godfrey, USRA summers 2014-2016
Emily Korfanty, USRA summers 2015, 2016
Ryan Cole, USRA summer 2013, 2014
Aaron Curtis, summers 2013-2015
Michael Becker, USRA summer 2012
Greg Hodgson, summer 2012 (with Prof. R. Shiell)
Kevin Ironside, summer 2012

Membership on thesis/dissertation/exam committees

Current:

1. Elmira Nazri, MTSC M.Sc. student with Andrew Vreugdenhil (Trent)
2. Kyle Fisher, MTSC Ph.D. student with Andrew Vreugdenhil (Trent)

Past:

PhD. External Examiner

1. Damon DePaoli, "Guiding Deep Brain Stimulation Neurosurgery with Optical Spectroscopy". PhD thesis, Université Laval, 2019.
2. Tanant Waritanant, "Highly Efficient Diode-Pumped Lasers Based on In-Band Pumping of Nd:YVO₄ Crystal". PhD Thesis, University of Manitoba, 2017.

M.Sc. Thesis supervisory Committee:

1. Sergio Majluf Suarez, MSc, Materials Science, "Empirically Detecting Colour: Using solar cells as colour sensors", 2021
2. Sydney Cobourn, PhD, Materials Science (Ontario Tech University), "Effect of Copper Contamination at the Cathode in Cu-Cl Electrolyzers for Hydrogen Production", 2020
3. Oliver Strong, MSc, Materials Science, "Phosphoric Acid Chemically Activated Waste Wood", 2018
4. Austin Nehring, MSc, Materials Science, "Depletant Induced Stacking Of Red Blood Cells Into Rouleaux", 2018
5. Patrick Lafleur, MSc, Materials Science, "A Model for the Differential Susceptibility of Strontium Titanate", 2016
6. Lisa Ugray, MSc, Materials Science, "Heavy Rydberg Photo-dissociation Cross-section Calculations and Experimental Progress Towards Cold Collisions in Lithium", 2013
7. Donald McGillivray, MSc, Ontario Tech University, Materials Science, "Supercritical CO₂ Synthesis of Carbon Nanotube/TiO₂ Composites and Films", 2013
8. Matthew Romerein, MSc, Materials Science, "Precision Measurements Using Semiconductor Light Sources: Applications in Polarimetry and Spectroscopy", 2011

Thesis examination chair:

1. Yuchen Song, MSc. Thesis, Materials Science, 2020
2. Donovan Allum, MSc. Thesis, Materials Science, 2019
3. Kelsey Chapman, MSc. thesis, Materials Science, 2019
4. Dimitrios Kallikragas, MSc thesis, Materials Science, 2014

Administrative and Service Responsibilities at Trent University:

- **Trent University Board of Governors**, 2019-Present
- **Department Chair**, Physics & Astronomy, 2020-Present
- **Director**, Trent-Ontario Tech University Materials Science Graduate Program, 2018-2020
- Trent University Senate, 2019-2020.
- Chair of CRC-I search committee for Dept. of Biology, 2019.
- Dean's Working Group on the School of the Environment (2014-2015)
- Advisor to the TUFA Equity committee in the matter of statistical analysis of pay gaps and pay equity, 2017.
- Bachelor's of Arts and Sciences (BAS) program committee member, 2016-Present
- Pre-med opportunities working group (Dean's), 2015-2017.
- TUFA nominating committee, 2016.

APPENDIX A:

Research output and communications:

Publications (my trainees are denoted with an asterisk*)

Peer-reviewed journal articles [# times cited (Google Scholar)—Sept. 2022]

44. **A. D. Slepko**
“Painting in polarization”
American Journal of Physics, **90**, 617 (2022); doi: 10.1119/5.0087800 [1 citations]
43. **A. D. Slepko**
“Quantitative measurement of birefringence in transparent films across the visible spectrum”
American Journal of Physics, **90**, 625 (2022); doi: 10.1119/5.0087798 [1 citations]
42. **A. D. Slepko**, M. L. Van Bussel*, K. M. Fitze*, and W. S. Burr
“A baseline for multiple-choice testing in the university classroom”
SAGE Open, **11** (2) (2021). <https://doi.org/10.1177/21582440211016838>
[2 citations]
41. R. A. Cole* and **A. D. Slepko**
“Polarization-enabled spectral-focusing CARS microscopy”
OSA Continuum, **3**, 2766-2781 (2020). [1 citations]
40. H. K. Khattak*, S. R. Waitukaitis, and **A. D. Slepko**
“Microwave induced mechanical activation of hydrogel dimers”
Soft Matter, **15**, 5804-5809 (2019) [1 citations]
39. H. K. Khattak*, P. Bianucci, and **A. D. Slepko**
“Linking plasma formation in grapes to microwave resonances of aqueous dimers”
Proc. Nat. Acad. Sci., **116**, 4000-4005 (2019) [57 citations]
38. A. T. K. Godfrey* and **A. D. Slepko**
“Partial Credit in Answer-Until-Correct Multiple-Choice Tests Deployed in a Classroom Setting”
Applied Measurement in Education, **32**, 138-150 (2019) [14 citation]
37. J. G. Porquez*, R. A. Cole*, and **A. D. Slepko**
“Comparison of two photonic crystal fibers for supercontinuum-Stokes spectral-focusing-CARS hyperspectroscopy”
OSA Continuum **1** (4), 1385-1399 (2018). [9 citations]
36. J. G. Porquez* and **A. D. Slepko**
“Application of spectral-focusing-CARS microscopy to pharmaceutical sample analysis”
AIP Advances **8**, 095213 (2018) [9 citations]
35. R. A. Cole* and **A. D. Slepko**
“Interplay of pulse bandwidth and spectral resolution in spectral-focusing CARS microscopy”

- Journal of the Optical Society of America B*, **35**, 842-850 (2018) [11 citations]
34. J. G. Porquez*, R. A. Cole*, J. T. Tabarangao*, and **A. D. Slepko**
“Brighter CARS hypermicroscopy via “spectral surfing” of a Stokes supercontinuum”
Optics Letters, **42**, 2255-2258 (2017) [16 citations]
33. J. G. Porquez*, R. A. Cole*, J. T. Tabarangao*, and **A. D. Slepko**
“Spectrally-broad coherent anti-Stokes Raman scattering hyper-microscopy utilizing a Stokes supercontinuum pumped at 800 nm”
Biomedical Optical Express, **7**, 4335-4345 (2016) [21 citations]
32. **A. D. Slepko**, A. J. Vreugdenhil, and R. C. Shiell
“Score Increase and Partial-Credit Validity When Administering Multiple-Choice Tests Using an answer-until-correct format”
Journal of Chemical Education, **93**, 1839-1846 (2016) [13 citation]
31. R. C. Shiell and **A. D. Slepko**
“Integrated Testlets: A New Form of Expert-Student Collaborative Testing”
Collected Essays in Teaching and Learning (CELT) **8**, 201-210 (2015) [13 citation]
30. J. T. Tabarangao* and **A. D. Slepko**
“Mimicking Multimodal Contrast with Vertex Component Analysis of Hyperspectral CARS Images”
Journal of Spectroscopy **2015**, 575807 (2015); doi:10.1155/2015/575807 [9 citations]
29. **A. D. Slepko**, K. B. Ironside*, and D. DiBattista
“Benford's Law: Textbook exercises and multiple-choice testbanks”
PLoS ONE **10**(2) e0117972. (2015); doi:10.1371/journal.pone [18 citation]
28. A. M. Barlow, **A. D. Slepko**, A. Ridsdale, P. J. McGinn, and A. Stolow
“Label-free hyperspectral nonlinear optical microscopy of the biofuel micro-algae *haematococcus pluvialis*”
Biomedical Optics Express **5**, 3391-3402 (2014). [16 citations]
27. **A. D. Slepko** and R. C. Shiell
“Comparison of integrated testlet and constructed-response question formats”
Phys. Rev. ST Phys. Educ. Res. **10**, 020120 (2014). [23 citations]
26. **Aaron D. Slepko**
“Integrated Testlets and the Immediate Feedback Assessment Technique”
American Journal of Physics **81**, 782 (2013); doi: 10.1119/1.4820241 [22 citations]
25. A. F. Pegoraro, **A. D. Slepko**, A. Ridsdale, D. J. Moffatt, and A. Stolow
“Hyperspectral multi-modal CARS microscopy in the fingerprint region”
Journal of Biophotonics **7**: 49–58 (2014). [62 citations]
24. A. M. Barlow, K. Popov, M. Andreana, D. J. Moffatt, A. Ridsdale, **A. D. Slepko**, J. L. Harden, L. Ramunno, and A. Stolow
“Spatial-spectral coupling in coherent anti-Stokes Raman scattering microscopy”
Optics Express **21**, 15298-15307 (2013) [16 citations]

23. R. C. Burruss, **A. D. Slepko**v, A. F. Pegoraro, A. Ridsdale, D. J. Moffatt, and A. Stolow,
“Unraveling the complexity of deep gas accumulations with 3D multimodal CARS microscopy”
Geology **40**, 1063-1066 (2012) [27 citations]
22. S. E. Schrauth, B. Shim, **A. D. Slepko**v, L. T. Vuong, A. L. Gaeta, N. Gavish, and G. Fibich
“Pulse splitting in the anomalous group-velocity dispersion regime”
Optics Express **19**, 9157-9171 (2011). [11 citations]
21. **A. D. Slepko**v, A. Ridsdale, T. Ning, J. Wang, A. F. Pegoraro, D. J. Moffatt, F.-J. Kao, J. P. Pezacki, and A. Stolow
“Forward-collected simultaneous fluorescence lifetime imaging and coherent anti-Stokes Raman microscopy”
Journal of Biomedical Optics **16**, 021103 (2011). [22 citations]
20. **A. D. Slepko**v, A. Ridsdale, A. F. Pegoraro, D. J. Moffatt, and A. Stolow
“Multimodal CARS Microscopy of Structured Carbohydrate Biopolymers”
Biomedical Optics Express **1**, 1347–1357 (2010). [51 citations]
19. K. Ohta, S. Yamada, and K. Kamada; **A. D. Slepko**v and F. A. Hegmann; R. R. Tykwinski; L. D. Shirtcliff and M. M. Haley; P. Sałek, F. Gel'mukhanov, and H. Ågren
“Two-Photon Absorption Properties of Two-Dimensional π -Conjugated Chromophores: Combined Experimental and Theoretical Study”
Journal of Physical Chemistry A **115**, 105-117 (2011). [54 citations]
18. A. F. Pegoraro, **A. D. Slepko**v, A. Ridsdale, J. P. Pezacki, and A. Stolow
“Single laser source for multimodal coherent anti-Stokes Raman scattering microscopy”
Applied Optics **49**, F10–F17 (2010). [21 citations]
17. V. Venkataraman, P. Londero, A. R. Bhagwat, **A. D. Slepko**v, and A. L. Gaeta
“All-Optical Modulation of Four Wave Mixing in Rb-Filled Photonic Band-Gap Fiber”
Optics Letters **35**, 2281-2283 (2010). [29 citations]
16. G. M. Guryanov, **A. D. Slepko**v, A. L. Gaeta, and K. W. Koch
“SIMS analysis of Rb-doped hollow-core photonic band-gap silica fiber using a CAMECA 4550 instrument”
Surface and Interface Analysis **43**, 566–568(2011). [2 citations]
15. **A. D. Slepko**v, A. R. Bhagwat, V. Venkataraman, P. Londero, and A. L. Gaeta
“Spectroscopy of Rb atom in hollow-core fiber”
Physical Review A **81**, 053825 (2010). [80 citations]
14. P. Londero, V. Venkataraman, A. R. Bhagwat, **A. D. Slepko**v, and A. L. Gaeta
“Ultralow-power four-wave mixing with Rb in hollow-core photonic band-gap fiber”
Physical Review Letters **103**, 043602 (2009). [82 citations]
13. A. R. Bhagwat, **A. D. Slepko**v, V. Venkataraman, P. Londero, and A. L. Gaeta
“On-demand all-optical generation of controlled Rb-vapor densities in photonic bandgap fibers”
Physical Review A **79**, 063809 (2009). [36 citations]

12. **A. D. Slepko**v, A. R. Bhagwat, V. Venkataraman, P. Londero, and A. L. Gaeta
“Generation of large alkali vapor densities inside bare hollow-core photonic band-gap fibers”
Optics Express **16**, 18976-18983 (2008). [71 citations]
11. Y. Okawachi, **A. D. Slepko**v, I. H. Agha, D. F. Geraghty, and A. L. Gaeta
“Absorption of ultrashort optical pulses in water”
Journal of the Optical Society of America A **24**, 3343-3347 (2007). [15 citations]
10. Y. Zhao, N. Zhou, **A. D. Slepko**v, S. C. Ciulei, R. McDonald, F. A. Hegmann, and R. R. Tykwinski
“Donor/acceptor effects on linear and nonlinear optical properties of geminal-diethynylethenes (g-DEEs)”
Helvetica Chimica Acta **90**, 909-927 (2007). [29 citations]
9. **A. D. Slepko**v, F. A. Hegmann, R. R. Tykwinski, K. Kamada, K. Ohta, J. A. Marsden, E. L. Spitler, J. J. Miller, and M. M. Haley
“Two-photon absorption in 2-D conjugated quadrupolar chromophores”
Optics Letters **31**, 3315-3317 (2006). [49 citations]
8. Y. Zhao, Y. Shirai, **A. D. Slepko**v, L. Cheng, L. B. Alemany, T. Sasaki, F. A. Hegmann, and J. M. Tour
“Synthesis, spectroscopy and nonlinear optical properties of multiple [60]fullerene-oligo (p-Phenylene Ethynylene) hybrids”
Chemistry—A European Journal **11**, 3643-3658 (2005). [129 citations]
7. S. Eisler, **A. D. Slepko**v, E. Elliott, T. Luu, R. McDonald, F. A. Hegmann, and R. R. Tykwinski
“Polyynes as a model for carbyne: synthesis, physical properties and nonlinear optical response”
Journal of the American Chemical Society **127**, 2666-2676, (2005). [404 citations]
6. T. Luu, E. Elliott, **A. D. Slepko**v, S. Eisler, R. McDonald, F. A. Hegmann, and R. R. Tykwinski
“Synthesis, structure and nonlinear optical properties of diarylpolyynes”
Organic Letters **7**, 51-54 (2005). [124 citations]
5. Y. Zhao, **A. D. Slepko**v, C. O. Akoto, R. McDonald, F. A. Hegmann, and R. R. Tykwinski
“Synthesis, structure, and nonlinear optical properties of cross-conjugated perphenylated iso-polydiacetylenes”
Chemistry—A European Journal **10**, 1-10 (2004). [66 citations]
4. **A. D. Slepko**v, F. A. Hegmann, S. Eisler, E. Elliott, and R. R. Tykwinski
“The surprising nonlinear optical properties of conjugated polyyne oligomers”
Journal of Chemical Physics **120**, 6807-6810 (2004). [162 citations]
3. **A. D. Slepko**v, F. A. Hegmann, K. Kamada, Y. Zhao and R. R. Tykwinski
“Optical properties of cross-conjugated iso-polydiacetylene oligomers as measured by UV-Vis spectroscopy and the optical Kerr effect”
Journal of Optics A: Pure and Applied Optics **4** 207-211 (2002). [9 citations]
2. **A. D. Slepko**v, F. A. Hegmann, Y. Zhao, R. R. Tykwinski and K. Kamada
“Ultrafast optical Kerr effect measurements of third-order nonlinearities in cross-conjugated iso-polydiacetylene oligomers”
Journal of Chemical Physics **116**, 3834-3840 (2002). [84 citations]

1. M.G. Hildebrand, **A. Slepko**v, M. Reedyk, G. Amow, J.E. Greedan, and D.A. Crandles
"Far-infrared optical properties of antiferromagnetic SmTiO₃"
Physical Review B **59**, 6938-6942 (1999). [6 citations]

Articles in refereed conference proceedings

28. Yuchen Song*, John Shafe-Purcell*, and **A. D. Slepko**v, "Volumetric Observation of Microwave Resonances in Grape-sized Aqueous Spheroids,"
2022 Photonics North (PN), eCF Paper Id: 395638 (in production)
27. **A. D. Slepko**v, "Birefringence in transparent household films: Quantitative measurement and dazzling demonstrations,"
Education and Training in Optics & Photonics Conference 2021, A. Danner, A. Poulin-Girard, and N. Wong, eds., OSA Technical Digest (Optica Publishing Group, 2021), paper F2A.6.
26. R. C. Shiell and **A. D. Slepko**v, "Integrated Testlets in Optics and Photonics: A Novel Assessment Tool and its Online Deployment,"
Education and Training in Optics & Photonics Conference 2021, A. Danner, A. Poulin-Girard, and N. Wong, eds., OSA Technical Digest (Optica Publishing Group, 2021), paper W2A.3.
25. M. Hu* and A. D. Slepko, "Microwave resonances in aqueous monomer and dimers,"
2021 Photonics North (PN), 1 (2021) doi: 10.1109/PN52152.2021.9597967.
24. J. G. Porquez* and **A. D. Slepko**v
"Broadband spectral focusing CARS of pharmaceutical drugs"
Conference on Lasers and Electro-Optics, OSA Technical Digest (online) (Optical Society of America, 2018), paper AF2M.1.
23. J. T. Tabarangao*, J. G. Porquez*, and **A. D. Slepko**v
"Hyperspectral and multimodal CARS microscopy of structured endogenous biomolecules in *Euglena gracilis*"
Conference on Lasers and Electro-Optics, OSA Technical Digest (online) (Optical Society of America, 2018), paper JTh2A.105.
22. **A. D. Slepko**v, H. K. Khattak*, and P. Bianucci
"Sub-wavelength microwave photonic hotspots in fruit and other aqueous dimers"
Advanced Photonics 2018, OSA Technical Digest (online) (Optical Society of America, 2018), paper NoW4J.2.
21. J. G. Porquez* and **A. D. Slepko**v
"Spectral-surfing CARS hypermicroscopy of pharmaceutical samples with commercial supercontinuum generating photonic crystal fibres,"
in *Advanced Photonics 2018*, OSA Technical Digest (online) (Optical Society of America, 2018), paper JTU5A.67
20. J. G. Porquez*, J. T. Tabarangao*, R. A. Cole*, and **A. D. Slepko**v
"Brighter CARS hypermicroscopy via 'spectral surfing'"
2017 Photonics North, Ottawa, ON, 2017, pp. 1-1. doi: 10.1109/PN.2017.8090557

19. **A. D. Slepko**v, E. R. Korfanty*, A. Curtis*, P. Bianucci, and A. P. Bambi, "Grape balls of fire!: Photonic interactions of hyperfrequency radiation with aqueous dielectric spheres," *2017 Photonics North*, Ottawa, ON, 2017, pp. 1-1. doi: 10.1109/PN.2017.8090559
18. J. G. Porquez*, E. R. Korfanty*, and **A. D. Slepko**v "Ultra-broadband coherent anti-Stokes Raman scattering microscopy with a dynamically power-tuned Stokes supercontinuum" *Proc. SPIE*, vol. **10069** 1006915, doi: 10.1117/12.2252530 (2017)
17. J. T. Tabarangao* and **A. D. Slepko**v "Multimodal Contrast" from the Vertex Component Analysis of Hyperspectral CARS Images" *Optics in the Life Sciences*, OSA Technical Digest (Optical Society of America, 2015), paper NT2C.5 (2015)
16. A. M. Barlow, J. T. Tabarangao*, A. Ridsdale, A. Stolow, and **A. D. Slepko**v "Sub-mM Imaging of Carotenoids Using Electronic and Vibrational Nonlinear Optical Microscopy" *Optics in the Life Sciences*, OSA Technical Digest (Optical Society of America, 2015), paper OT1C.3 (2015)
15. **A. D. Slepko**v, A. M. Barlow, A. Ridsdale, P. J. McGinn, and A. Stolow "In vivo hyperspectral CARS and FWM microscopy of carotenoid accumulation in *H. Pluvialis*" *Proc. SPIE*, vol **8937**, 893709, doi:10.1117/12.2038229 (2014).
14. A. M. Barlow, K. Popov, M. Andreana, D. J. Moffatt, A. Ridsdale, **A. D. Slepko**v, L. Ramunno, and A. Stolow "Spatial-spectral coupling in hyperspectral CARS microscopy image formation" *Proc. SPIE*, vol **8589**, 85890T (2013)
13. A. C.-T. Ko, L. B. Mostaço-Guidolin, A. Ridsdale, A. F. Pegoraro, M. S.D. Smith, **A. D. Slepko**v, M. D. Hewko, E. K. Kohlenberg, B. Schattka, A. Stolow, M. G. Sowa "Using multimodal femtosecond CARS imaging to determine plaque burden in luminal atherosclerosis" *Proc. SPIE*, Vol **7903**, 790318 (2011)
12. P. S. Londero, J. Levy, **A. Slepko**v, A. Bhagwat, K. Saha, V. Venkataraman, M. Lipson, and A. L. Gaeta "Chip-based optical interactions with rubidium vapor" *Quantum Electronics and Laser Science Conference*, OSA Technical Digest (CD) (Optical Society of America, 2010), paper QFE4.
11. V. Venkataraman, A. R. Bhagwat, P. Londero, **A. D. Slepko**v, and A. L. Gaeta "Ultralow-power nonlinear optics with Rb-filled photonic band-gap fibers" *Nonlinear Optics: Materials, Fundamentals and Applications*, OSA Technical Digest (CD) (Optical Society of America, 2009), paper NWB4.
10. P. S. Londero, V. Venkataraman, A. R. Bhagwat, **A. D. Slepko**v, and A. L. Gaeta "All-optical modulation of four wave mixing in a Rb-filled hollow-core photonic band-gap fiber"

Conference on Lasers and Electro-Optics/International Quantum Electronics Conference, OSA Technical Digest (CD) (Optical Society of America, 2009), paper IMC3.

9. A. F. Pegoraro, **A. D. Slepikov**, A. Ridsdale, R. K. Lyn, D. J. Moffatt, J. P. Pezacki, B. K. Thomas, L. Fu, L. Dong, M. E. Fermann, and A. Stolow
"High performance multimodal CARS microscopy using a single femtosecond source"
Proc. SPIE, Vol **7569**, 756908 (2010)
8. **A. D. Slepikov**, A. R. Bhagwat, V. Venkataraman, P. Londero, and A. L. Gaeta
"Diffusion and Redistribution of Rubidium in Hollow-Core Photonic Bandgap Fibers"
International Quantum Electronics Conference (IQEC) 2009 Technical Digest, IMC2, pp. 1-2 (2009).
7. B. Shim, S. E. Schrauth, C. J. Hensley, P. Hui, **A. D. Slepikov**, A. A. Ishaaya, L. T. Vuong, and A. L. Gaeta
"Controlled interactions of femtosecond light filaments in air"
Frontiers in Optics, OSA Technical Digest (CD) (Optical Society of America, 2008), paper FTuV4.
6. S. E. Schrauth, B. Shim, **A. D. Slepikov**, L. T. Vuong, and A. L. Gaeta
"Pulse splitting of temporal super-Gaussian pulses in the anomalous dispersion regime"
Frontiers in Optics, OSA Technical Digest (CD) (Optical Society of America, 2008), paper FTuV5.
5. P. S. Londero, V. Venkataraman, A. R. Bhagwat, **A. D. Slepikov**, and A. L. Gaeta
"Ultralow-power four-wave mixing with Rb in a hollow-core photonic band-gap fiber"
Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference and Photonic Applications Systems Technologies, OSA Technical Digest (CD) (Optical Society of America, 2008), paper QPDA7.
4. A. R. Bhagwat, **A. D. Slepikov**, V. Venkataraman, P. Londero, and A. L. Gaeta
"Production of controllable Rb-vapor densities in photonic bandgap fibers"
Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference and Photonic Applications Systems Technologies 2008 Technical Digest, JFA-4, pp. 1-2 (2008).
3. A. Tomalik, R. G. DeCorby, **A. D. Slepikov**, F. A. Hegmann, A. Major, P. W. Smith, J. S. Aitchison
"Ultrafast time-resolved and spectrally resolved measurements of third-order nonlinearities in As₂Se₃ chalcogenide glass"
Proc. SPIE, Vol. **5971**, pp. 74-82 (2005).
2. **A. D. Slepikov**, J. A. Marsden, J. J. Miller, L. D. Shirtcliff, M. M. Haley, K. Kamada, R. R. Tykwinski, and F. A. Hegmann
"The effects of donor-acceptor substitution symmetry on the nonlinear absorption of two-dimensionally-conjugated isomeric chromophores"
Proc. of SPIE, Vol. **5934**, pp. 29-37 (2005).
1. **A. D. Slepikov**, S. Eisler, T. Luu, E. Elliot, R. R. Tykwinski, and F. A. Hegmann
"The one-dimensional nature of polyynes"
Proc. of SPIE, Vol. **5935**, pp. 301-308 (2005).

Editor-reviewed (invited) articles

1. Aaron Slepko
"Painting with polarization"
NatureVolve **10** (2021);
https://issuu.com/naturevolve/docs/naturevolve_issue_10/s/14842679
2. Aaron Slepko
"Fruit photonics and the shape of water"
Physics Today 73, 6, **62** (2020); doi: 10.1063/PT.3.4507
3. A. D. Slepko
"Grape expectations: how balls of water can mimic metallic objects in the microwave oven"
The Science Breaker, July 26, 2019.
<https://doi.org/10.25250/thescbr.brk236>
4. "Aaron D. Slepko: Discovering Fundamental Truths in Physics." Today's Science, Infobase Learning, June 2019.
<http://tsof.infobaselearning.com/recordurl.aspx?wid=99270&ID=43027>.

Application Notes, White Papers, Industry Reports

1. E. R. Korfanty* and A. D. Slepko
"Temperature Imaging of Small Objects with Keysight U5855A TrueIR Thermal Imager"
CMC Microsystems Application Note, November 2016.
[<https://www.cmc.ca/WhatWeOffer/Products/CMC-00200-05052.aspx>]

Inclusion of research in textbooks

My work on the optical properties of polyynes is included in a popular monograph on the optical properties of solids [Mark Fox, "Optical Properties of Solids", Oxford University Press]. In this book, UV-vis absorption data and analysis from Slepko et al. *J. Chem. Phys.*, **120**, 6807-6810 (2004) are displayed and discussed as "textbook" examples of absorption by a molecular system, and furthermore as a clear and elegant example of the expected but rarely observed progression of vibronic coupling.

Select Presentations:

Invited Conference Presentations:

14. *Confirming internal microwave resonances in grape-sized aqueous objects using calorimetry, thermography, and FEM simulations*
invited talk given at CAP Congress 2022, Hamilton, June 2022.

13. *Fruit dimers as sub-wavelength microwave resonators*
invited talk given at Photonics North 2018, Montreal, June 2018.
12. *Integrated Testlets: Multiple-Choice Testing 2.0*
invited talk given at Canadian Association of Physicists (CAP) Congress 2016,
Ottawa, June 2016
11. *Label-free electronic and vibrational nonlinear imaging of carotenoids in microalga*
invited talk given at Photonics North 2015, Ottawa, June 2015
10. *Opportunities for multimodal CARS microscopy in materials science*
invited talk given at the Materials Science & Technology conference (MS&T2013),
Montreal, October 2013
9. *Simple implementation of multimodal CARS microscopy for biomaterial
characterization*
Invited talk given at the Chemical Society of Canada meeting, Quebec City, May
2013
8. *The expanding promise of multimodal broadband CARS microscopy*
Invited talk given at the Canadian Association of Physics Congress, Montreal, May
2013
7. *Agile multimodal CARS spectro-microscopy*
Plenary talk given at the Physics of Quantum Electronics (PQE-2011) conference,
Snowbird, Utah
January 2011
6. *Multimodal CARS spectro-microscopy of structured carbohydrate biopolymers*
First annual NRC-Olympus CARSLab Workshop, Ottawa, Ontario
November 2010
5. *Nonlinear microscopy of biological systems*
Presented at Trent University, Peterborough, Ontario
April 2010
4. *High resolution spectroscopy of Rb atoms in hollow-core fibres*
Presented at the Steacie Institute for Molecular Sciences, NRC, Ottawa
May 2009
3. *Light-Matter interactions in hollow-core fibres*
Presented at Brock University, St. Catharines, Ontario, and Grant MacEwan
University, Edmonton, Alberta
March 2009
2. *Conjugated molecules for nonlinear optics*
Presented at The Institute for Lasers, Photonics and Biophotonics, SUNY Buffalo,
NY (2005); The Institute for Polymers and Organic Solids (IPOS), UCSB, CA (2006);
The School of Applied and Engineering Physics, Cornell University, NY (2006)
1. *The hyperpolarizability of conjugated paths*
Presented at the Photonics Research Institute, National Institute of Advanced
Industrial Science and Technology, Ikeda, Japan
November 2004

Invited Colloquia and Public Presentations:

15. "Microwave Fruit Photonics and the Shape of Water"
Physics Today's Editor Series Webinar, December 2021.
14. "Grapes, Microwave Photonics, and the Shape of Water"
Colloquium given to Concordia University, Dept. of Physics, Oct 2021.
13. "Microwave Grape Plasma and the Shape of Water"
Colloquium given to St. Mary's University, Dept. of Chemistry, Jan 2021.
12. "Fruit Photonics and the Shape of Water"
2020 CAP Lecture Tour, University of Manitoba and University of Winnipeg, Nov. 2020.
11. "Fruit Plasma and the Shape of Water"
Seminar presented to Centre for Integrated Plasma Studies (CIPS) at UC Boulder, Sept 2020.
10. "Grapes, microwave photonics, and the shape of water"
Physics/Chemistry colloquium at Trent U, Peterborough, Ontario, October 2019.
9. "Integrated Testlets for Physics and Chemistry: Multiple Choice 2.0"
(i) Colloquium given at McMaster University, Hamilton, Ontario, January 2019.
(ii) Colloquium given at Guelph University, Guelph, Ontario, April 2019.
8. "Spectral-focussing CARS microscopy: The agile and inexpensive Swiss-army knife of label-free hypermicroscopy"
Colloquium given at Brock University, St. Catharines, Ontario, February 2018.
7. "Integrated Testlets: Multiple Choice Testing 2.0"
(i) Colloquium lecture, Department of Physics, Queens University, March 2015
(ii) Invited Seminar, CWSEI, UBC, Vancouver, BC, April 2015
6. "Technical considerations of modern vibrationally-based nonlinear optical microscopy"
Live Public Webinar Hosted by Photonics Media
(<http://photonics.com/Webinar.aspx?WID=42>), April 2014.
5. "Dude, where's my CARS?!"
Colloquium given at Ontario Tech University, August 2013
4. "Dude, where's my CARS? An agile tool for label-free materials characterization"
Colloquium given at the Brockhouse Institute for Materials Research, McMaster University, Nov. 2012.
3. "Label-free nonlinear optical microscopy: Fundamentals and opportunities"
Trent University Physics/Chemistry Colloquium, November, 2011.
2. "CARS microscopy now rocks: Applications of a biomedical tool in the geosciences"
Trent University Summer Seminar Series, August, 2011.
1. "Organic and hybrid nonlinear photonics"
University of Western Ontario, April, 2006.

Outreach Presentations and Guest Lectures:

12. "Painting In polarization", American Association of Physics Teachers' Author Series live webinar. Scheduled for October 11, 2022.
(<https://aapt.tradewing.com/event/MJQMLEE3yzzgfk3RFH>)
11. "Painting with polarization: A sneakily rich optics activity"
Ontario Association of Physics Teachers (Virtual) Physics Hour, April 2021.
10. "Painting in Polarization"
Guest lecture in Trent U ASCI 1001H. Trent University, Oct. 2020.
9. "Grape Balls O'Fire: How a physics project goes from WTF to Eureka"
Guest lecture in ASCI 1001H. Trent University, Oct. 2018.
8. Mistaken Movies: An evening run by the Trent Undergraduate Physics Society comprising a movie screening followed by a lecture on scientific curiosities and mistakes depicted in the film.
 - Mistaken Movies V: "Star Trek IV: The Voyage Home", March 2022
 - Mistaken Movies IV: "6 Underground", Jan 2020
 - Mistaken Movies III: "Mission Impossible: Fallout", Feb 2019
 - Mistaken Movies II: "X-Men", Feb 2018
 - Mistaken Movies: "Ant Man", March 2017
7. "The physics of Ant Man"
Guest Lecture in UNIV 1003H. Trent University, Aug. 2018 & Aug. 2019
6. "How to interpret your scantron reports: Improving multiple choice testing"
Presentation given through Trent's Centre for Teaching and Learning, Nov, 2016.
5. "Multiple-Choice Testing: Haters and Innovators"
A Late Night Against Procrastination (LNAP) 2016 talk, Trent U, March 2016.
4. "Scratch card assessments: A problem solved!"
A Teach & Tech workshop presented with Dr. Ralph Shiell, Trent U, May 2015.
3. "How is a laser different than a light bulb? Perhaps it isn't..."
A Trent-50 talk given to Westmount Public School, Peterborough, December 2014.
2. "Multiple-Choice testing in an ESL context"
Presentation given to the Trent University ESL program, October 2014.
1. "Using multiple-choice structures for assessment of deeper knowledge: The immediate-feedback integrated-testlet"
Presentation given to the Trent University Instructional Development Centre, April 2013.

Selected Conference Presentations (presenter underlined):

38. Yuchen Song*, John Shafe-Purcell*, and A. D. Slepko
"Volumetric observation of microwave resonances in grape size aqueous spheroids"
Paper 255-gAnT-282, Photonics North 2022, Niagara Falls, May 2022.

37. A. D. Slepko
"Birefringence in transparent household films: Quantitative measurement and dazzling demonstrations"
Education and Training in Optics & Photonics (ETOP) virtual conference, F2A.6, Sept 2021.
36. R. C. Shiell and A. D. Slepko
"Integrated Testlets in Optics and Photonics: A Novel Assessment Tool and its Online Deployment"
Education and Training in Optics & Photonics (ETOP) virtual conference, W2A.3, Sept 2021.
35. Miao Hu* and A. D. Slepko.
"Microwave resonances in aqueous monomer and dimers"
Photonics North 2021, Online (synchronous worldwide) May 2021.
34. A. D. Slepko and H. K. Khattak*.
"Grapes, microwave photonics, and the shape of water"
First Photonics Online Meetup (POM 2020), Online (synchronous worldwide), Jan 2020.
33. A. D. Slepko, H. K. Khattak*, and P. Bianucci
"Sub-wavelength microwave photonic hotspots in fruit and other aqueous dimers"
Advanced Photonics Congress, Zurich, July 2018.
32. J. G. Porquez* and A. D. Slepko
"High-speed hyperspectral imaging of pharmaceutical drugs with spectral focusing CARS"
Photonics North 2018, Montreal, June 2018.
31. A. D. Slepko, E. R. Korfanty*, A. Curtis*, P. Bianucci, and A. P. Bambic
"Grape Balls of Fire: Photonic Interactions of Microwave Radiation with Aqueous Dielectric Spheres"
Photonics North, Ottawa, June 2017.
30. J. G. Porquez*, E. R. Korfanty*, and A. D. Slepko
"Ultra-broadband coherent anti-Stokes Raman scattering microscopy with a dynamically power-tuned Stokes supercontinuum"
SPIE Photonics West, San Francisco, USA, January 2017.
29. A. D. Slepko.
"Educated vs. random guessing: validating partial-credit schemes in scratch-card multiple-choice exams."
Session CON08.13a, STLHE 2016, London, Ontario, June 2016
28. J. Porquez*, R. Cole, J. T. Tabarangao*, and A. D. Slepko.
"Spectrally Broad Spectral-Focussing-Based Coherent Anti-Stokes Raman Hyper-Microscopy With a Single 800-nm Laser Source."
Poster presented at SPEC 2016, Montreal, June 2016.
27. J. T. Tabarangao* and A. D. Slepko
"Multimodal Contrast" from the Vertex Component Analysis of Hyperspectral CARS Images"
Optics in the Life Sciences 2015: Novel Techniques in Microscopy, Vancouver, April 2015.

26. A. M. Barlow, J. T. Tabarangao*, A. Ridsdale, A. Stolow, and A. D. Slepko
“Sub-mM Imaging of Carotenoids Using Electronic and Vibrational Nonlinear Optical Microscopy”
Optics in the Life Sciences 2015: Optical Molecular Probes, Imaging and Drug Delivery, Vancouver, April 2015.
25. A. D. Slepko and R. C. Shiell
“The Integrated Testlet: A powerful multiple-choice approach for STEM assessment”
Workshop co-presented at the Western Conference on Science Education (WCSE 2015), London, Ontario, July 2015
24. R. C. Shiell and A. D. Slepko
“Composing Integrated Testlets Across Disciplines”
workshop presented at STLHE-2015, Vancouver, June 2015.
23. A. D. Slepko and R. C. Shiell
“Integrated Testlets: How to use multiple-choice structures to both test and form deeper physics knowledge in the classroom and beyond”
Workshop presented at the 2015 OAPT conference, Guelph, Ontario May 2015.
22. A. T. K. Godfrey* and A. D. Slepko
“Revisiting Correlations in Classical Item Analysis: The Case of ‘Testlets’ in Physics Education Research”
Poster, Canadian Undergraduate Physics Conference (CUPC 2014), Kingston, October 2014.
21. A. M. Barlow, A. D. Slepko, A. Ridsdale, P. McGinn, and A. Stolow
“In vivo Four-Wave Mixing Microscopies of Carotenoids”
Photonics North 2014, Montreal, June 2014
20. J. T. Tabarangao*, and A. D. Slepko
“Multivariate Analysis of Hyperspectral Coherent Anti-Stokes Raman Scattering” (CARS) Images
Poster presented at the Chemical Biophysics Symposium, Toronto, May 2014.
19. A. D. Slepko and R. C. Shiell
“Integrated Testlets: A Powerful Multiple-Choice Testing Platform for Assessing Deeper Knowledge”
Workshop presented at STLHE-2014, Kingston, Ontario, June 2014.
18. A. D. Slepko, A. M. Barlow, A. Ridsdale, J. T. Tabarangao, and A. Stolow
“Resonant hyperspectral CARS and FWM microscopy of in-vivo carotenoid accumulation in *H. Pluvialis*”
SPIE Photonics West, San Francisco, USA, February 2014.
17. A. D. Slepko, A. F. Pegoraro, A. Ridsdale, A. J. Moffatt, and A. Stolow
“Chemically-selective spectral imaging of bone mineral density and the collagen manifold in bulk bone using CARS and SHG”
SPIE Photonics West, San Francisco, USA, January 2012.
16. R. C. Burruss, A. D. Slepko, A. F. Pegoraro, and A. Stolow
“Coherent anti-Stokes Raman scattering (CARS) microscopy of fluid inclusions: Multimodal 3D, chemically selective imaging and spectroscopy”

European Current Research on Fluid Inclusions (ECROFI-XXI), Leoben, Austria, August 2011.

15. R. C. Burruss, A. D. Slepko, A. F. Pegoraro, and A. Stolow
“GEO-CARS: 3-D, chemically selective imaging of fluid inclusions with multimodal nonlinear optical microscopy“
Goldschmidt2011, Prague, Czech Republic, August 2011.
14. A. D. Slepko, R. C. Burruss, A. F. Pegoraro, A. Ridsdale, and A. Stolow
“CARS microscopy rocks: New applications for multimodal microscopy in the geosciences”
Photonics North, Ottawa, 2011.
13. A. D. Slepko, A. Ridsdale, A. F. Pegoraro, D. J. Moffatt, and A. Stolow
“Spectrally-resolved CARS microscopy of condensed carbohydrate systems materials”
Poster presented at Photonics West, San Francisco, USA, 2011.
12. A. D. Slepko, A. Ridsdale, A. F. Pegoraro, J. P. Pezacki, and A. Stolow
“Agile multimodal CARS microscopy and micro-spectroscopy of live cells and tissues”
Poster presented at Photonics North, Niagara Falls, 2010.
11. A. D. Slepko, A. Ridsdale, A. F. Pegoraro, G. Labroille, and A. Stolow
“Optimizing spectral resolution in supercontinuum-generation-based femtosecond CARS microscopy”
Conference on Lasers and Electro-Optics (CLEO/QELS), San Jose, USA, 2010.
10. A. D. Slepko, A. R. Bhagwat, V. Venkataraman, P. Londero and A. L. Gaeta
“High resolution spectroscopy of Rb atoms in hollow-core fibers”
Division of Atomic and Molecular Optics (DAMOP), Charlottesville, Virginia, USA, 2009.
9. A. D. Slepko, A. R. Bhagwat, V. Venkataraman, P. Londero and A. L. Gaeta
“Diffusion and Redistribution of Rubidium in Hollow-Core Photonic Bandgap Fibers”
Conference on Lasers and Electro-Optics (CLEO/QELS), Baltimore, USA, 2009.
8. A. D. Slepko, S. E. Schrauth, B. Shim, and A. L. Gaeta
“Ultrafast pulse carving with nondegenerate two-photon absorption: towards formation of spatiotemporal shell pulses”
3rd-International Conference on Optical and Optoelectronic Properties of Materials and Applications (ICOOPMA), Edmonton, Canada, 2008.
7. A. D. Slepko, J. A. Marsden, J. J. Miller, L. D. Shirtcliff, M. M. Haley, K. Kamada, R. R. Tykwinski, and F. A. Hegmann
“The effects of donor-acceptor substitution symmetry on the nonlinear absorption of two-dimensionally-conjugated isomeric chromophores”
SPIE Optics & Photonics, San Diego, USA , 2005.
6. A. D. Slepko, S. Eisler, E. Elliot, R. R. Tykwinski, and F. A. Hegmann
“The one-dimensional nature of polyynes”
Poster presented at SPIE Optics & Photonics, San Diego, USA, 2005.
5. A. D. Slepko, J. A. Marsden, J. J. Miller, M. M. Haley, R. R. Tykwinski, and F. A. Hegmann
“Donor-acceptor substitution symmetry and the nonlinear optical properties of planar chromophores”
American Physical Society March Meeting, Montreal, 2004.

4. A. D. Slepkov, S. Eisler, E. Elliott, F. A. Hegmann, and R. R. Tykwinski
"Polyynes as a model for carbyne: The surprisingly efficient third-order NLO properties of sp-hybridized carbon"
Optical Probes, Venice, Italy, 2003.
3. A. D. Slepkov, S. Eisler, E. Elliott, F. A. Hegmann, and R. R. Tykwinski
"Polyynes as a model for carbyne: The surprisingly efficient third-order NLO properties of sp-hybridized carbon"
American Physical Society March Meeting, Austen, Texas, 2003.
2. A. D. Slepkov, R. R. Tykwinski, K. Kamada, F. A. Hegmann
"A differential detection optical Kerr gate used for ultrafast measurements of third-order nonlinear processes in conjugated materials"
Poster presented at Optical Probes, Venice, Italy, 2003.
1. A. D. Slepkov, Y. Zhao, R. R. Tykwinski, and F. A. Hegmann
"Ultrafast optical Kerr effect measurements of third-order nonlinearities in novel polydiacetylene-based organic chromophores"
American Physical Society March Meeting, Seattle, Washington, 2001.

Invited Seminars and Workshops (paid)

3. "Integrated Testlets: Multiple-Choice Testing 2.0"
Gwenna Moss Centre, University of Saskatchewan, Nov. 2016.
2. "Creating and Modifying Integrated Testlets"
Gwenna Moss Centre, University of Saskatchewan, Nov. 2016.
1. "Writing and Assessing Good Multiple Choice Items / Getting the Most out of Your Scantron Reports"
Gwenna Moss Centre, University of Saskatchewan, Nov. 2016.

APPENDIX B:

CV of failures

Rejected Publications

14. Y. Song, J. S.-P., and A. D. Slepko (2022) "Linking microwave heating in aqueous spheres to morphology-dependent resonances".
Desk rejected from 1 Journal so far.
13. A. D. Slepko, *et al.*, (2019) "A baseline for multiple-choice testing in the university classroom".
Desk rejected from 2 prior journals.
Post-review rejected from 1 prior journal.
12. H. K. Khattak, *et al.*, "The Wrath of Grapes: Microwave Morphology-Dependent Resonances in Aqueous Dimers". Submitted to Year in Review 2019, OPN.
Rejected.
11. H. K. Khattak, *et al.*, (2019) "Microwave induced mechanical activation of hydrogel dimers"
Desk rejected from 2 prior journals.
10. H. K. Khattak, *et al.*, (2019) "Linking plasma formation in grapes to microwave resonances of aqueous dimers"
Desk rejected from 4 prior journals
Post-review rejected from 1 prior journal
9. J. G. Porquez, *et al.*, (2018) "A comparison of two photonic crystal fibers for supercontinuum-Stokes spectral-focusing-CARS hyperspectroscopy"
Desk rejected from 1 journal
8. J. G. Porquez, *et al.*, (2018) "Application of spectral-focusing-CARS microscopy to pharmaceutical sample analysis"
Rejected from 1 prior journal [as an invited article!]
7. J. G. Porquez, *et al.*, (2017) "Brighter CARS hypermicroscopy via "spectral surfing" of a Stokes supercontinuum"
Desk rejected from 1 prior journal
6. A. D. Slepko, *et al.*, (2015) "Partial Credit in Answer-Until-Correct Multiple-Choice Test Formats". (Published under modified name in 2019)
Rejected from 2 prior journals
5. A. D. Slepko, *et al.*, *PLoS ONE* **10**(2) e0117972. (2015).
Rejected from 1 prior journal.
4. A. M. Barlow, *et al.*, *Biomed. Opt. Express* **5**, 3391-3402 (2014);
Rejected from 1 prior journal
3. A. M. Barlow, *et al.*, *Optics Express* **21**, 15298-15307 (2013);
Rejected from 1 prior journal
2. R. C. Burruss, *et al.*, *Geology* **40**, 1063-1066 (2012);

Rejected from 2 prior journals

1. A. D. Slepko, *et al.*, *Journal of Chemical Physics* **120**, 6807-6810 (2004).
Rejected from 2 prior journals

Rejected Conference Proposals

3. Proposal for presentation at 2018 CLEO/QUELS conference, titled “Plasma from grapes in a microwave oven: Microwave photonic hotspots in aqueous dimers”—Rejected for oral or poster pres.
2. Proposal for presentation at 2018 SPIE Photonics West, titled “Grape Balls of Fire: Mie Resonances and sub-wavelength focusing of microwave radiation in aqueous bispheres”—Rejected for oral pres.
1. Proposal for presentation at 2011 SPIE Photonics West, titled “Spectrally-Resolved CARS Microscopy of Condensed Carbohydrate Systems”—Rejected for Oral pres.

Rejected and unfunded grants

8. Wickerson Fund (Trent University), “Optimizing an answer-until-correct self-study tool that may be adopted by all students, across a wide range of disciplines”. Co-applicant with Prof. Rayf Shiell, 2020—Not Funded
7. NSERC Research Tools and Infrastructure Grant (RTI). Co-applicant. Title: “Imaging equipment for soft material characterization research in biomechanics and microwave photonics”. 2020 cycle—Not Funded
6. NSERC Research Tools and Infrastructure Grant (RTI). Co-applicant. Title: “High-speed and high-resolution video and thermal imaging for new research in the materials and forensic sciences”. 2019 cycle—Not Funded
5. NSERC Research Tools and Infrastructure Grant (RTI). Title: “Second-stage laser source for multimodal coherent Raman scattering microscopy”. 2018 cycle—Not Funded
4. Ontario MRI Early Researcher Award (ERA). Title: “Developing nonlinear optical microscopy tools for characterization and imaging of energy-relevant materials”. Round 10, 2014—Not Funded
3. NSERC Research Tools and Infrastructure Grant (RTI). Title: “Resonance Raman Tool for Near Infrared Biomaterials Characterization”. 2013 cycle—Not Funded
2. NSERC Research Tools and Infrastructure Grant (RTI). Title: “Raman microscopy tool for integration into a nonlinear optical microscope”. 2011 cycle—Not Funded
1. Ontario MRI Early Researcher Award (ERA). Title: “Answering challenging geological questions with biomedical imaging tools”. Round 8, 2011—Not Funded

Academic/Industrial Job application failures

- 2007: Applied to industrial researcher position (interviewed, no offer)
Applied to 4 tenure-track positions (no interviews)
- 2008: Applied to 11 tenure-track positions in the USA (no interviews)
Applied to 5 tenure-track positions in Canada (2 interviews, no offers)
Applied to a CRC-II tenure-track position in Canada (interviewed, no offer)
Applied to government scientist position (interviewed, no offer)
- 2009: Applied to one tenure-track position in and two industrial research positions in Canada (no interviews)
- 2010: Applied to two tenure-track positions in Canada (no interviews)

Other

1. Nominated for a Decanal Award for Teaching Excellence in the Sciences. Not awarded (2022)
2. Co-nominated for a STLHE Alan Blizzard Award for collaborative teaching. Not awarded (2019).
3. Twice nominated for an Educational Leadership and Innovation teaching award at Trent university; not awarded (2013, 2014).
4. Applied for a Trent University Merit Award—Rejected, 2013.