

David G. Cooke - Curriculum Vitae

Contact information

E. Rutherford Physics Bldg. Ph.: +1 (514) 398-2766
McGill University Fax: +1 (514) 398-8434
3600 rue University E-mail: dave.cooke@mcgill.ca
Montréal, QC, Canada H3A 2T8 Website: <https://thz.lab.mcgill.ca>

Employment/Education

- June 2017 –present Associate Professor, tenured**
Department of Physics
McGill University
- Jan. 2011 –June 2017 Assistant Professor, tenure-track**
Department of Physics
McGill University
- Nov. 2009 –Oct. 2010 Associate Professor, non-tenure track**
Department of Photonics Engineering, Technical University of Denmark
- Nov. 2008 –Nov. 2009 Assistant Professor, non-tenure track**
Department of Photonics Engineering, Technical University of Denmark
- Aug. 2007 –Aug. 2009 H. C. Ørsted Postdoctoral Fellow**
Group of Peter Uhd Jepsen,
Department of Photonics Engineering, Technical University of Denmark
- Nov. 2006 –July 2007 Postdoctoral Fellow**
Group of Peter Uhd Jepsen,
Department of Photonics Engineering, Technical University of Denmark
- Sept. 2001 –Oct. 2006 PhD in Experimental Condensed Matter Physics**
Department of Physics, University of Alberta, Canada
Advisor: Prof. Frank A. Hegmann
- Sept. 1997 – Apr. 2001 BSc (honours with distinction) in Physics**
Dept. of Physics, St. Francis Xavier University,
Antigonish, Nova Scotia, Canada

Awards and Distinctions

- [1] 2007-2009 H. C. Oersted's Postdoctoral Fellow, Technical University of Denmark
- [2] 2018 Fessenden Professorship, McGill
- [3] 2023 Wares Prospector Award, McGill

Major Service

- [1] Sept. 17 - 22, 2023 General Chair of IRMMW 2023, Montreal (largest + oldest THz conference, 620 participants, 25 exhibitors).
- [2] 2019-2023 Director of McGill Centre for the Physics of Materials (CPM)
- [3] 2016-2019 Associate Editor - Optics Express (handled ~ 100 papers/year)

1 Publications

The citation statistics for my publications is shown in Fig. 1.1. These have made a significant impact with 6245 citations. My current h-index is 31 and i-10 index is 46 (Google Scholar). Below I underline students and postdocs/RAs I have supervised in the author list and my name is bolded for clarity of authorship role. Last authors are generally the main PI in my field.

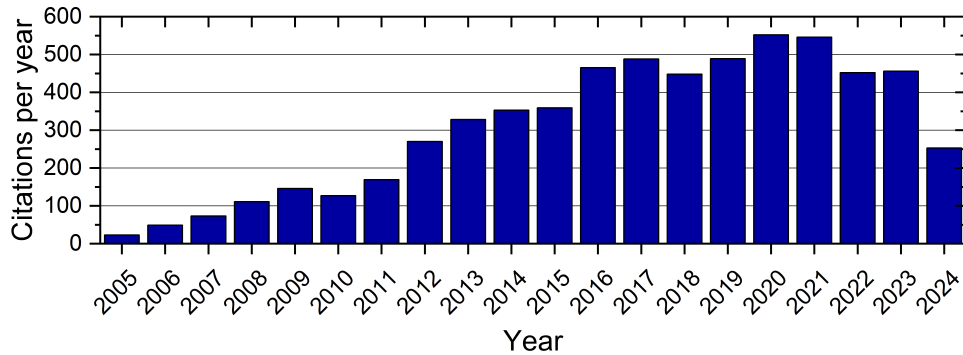


Figure 1.1: Citation data taken from Google Scholar, Aug. 9, 2024.

1.1 Papers submitted to refereed journals

- [1] M. J. Maher, C. M. Lund, J. Bancheri, **D. G. Cooke**, J. Seuntjens
Simulation and analytic description of field distortions for uniform excitation of radial parallel plate waveguides
Submitted to: *Medical Physics - Manuscript #24-2027*
- [2] B. Colmey, R. T. Paulino, G. Beaufort and **D. G. Cooke**
Sub-cycle nanotip field emission of electrons driven by air-plasma generated terahertz pulses
arXiv:2409.07196 [cond-mat.mtrl-sci]

1.2 Papers published in refereed journals

- [4] R. T. Paulino, B. Colmey and **D. G. Cooke**
Spatiotemporal walk-off and improved focusing of plasma THz sources
Opt. Express **32**, 26351 (2024).
- [5] B. J. Dringoli, M. Sutton, Z. Luo, M. G. Kanatzidis and **D. G. Cooke**
Ultrafast Photoinduced Phase Change in SnSe
Phys. Rev. Lett. **132**, 146901 (2024).
- [6] A. W. Schiff-Kearn, L. Gingras, S. Bernier, N. Chamanara, K. Agarwal, J. -M. Ménard and **D. G. Cooke**
Front-induced transitions control THz waves
Comm. Phys. **4**, 162 (2021).

- [7] D. Matte, N. Chamanara, L. Gingras, L. P. René de Cotret, T. L. Britt, B. J. Siwick and **D. G. Cooke**
Extreme Lightwave Electron Field Emission from a Nanotip,
[Phys. Rev. Res. 3, 013137 \(2021\)](#).
- [8] Z. Schumacher, R. Rejali, R. Pachlatko, A. Spielhofer, Y. Miyahara, **D. G. Cooke** and P. Grütter
Nanoscale force sensing of an ultrafast nonlinear optical response
[Proc. Nat. Acad. Sci. 117, 19773 \(2020\)](#).
- [9] Y. Lan, X. Tao, X. Kong, Y. He, X. Zheng, M. Sutton, M. G. Kanatzidis, H. Guo and **D. G. Cooke**
Coherent charge-phonon correlations and exciton dynamics in orthorhombic $CH_3NH_3PbI_3$ measured by ultrafast multi-THz spectroscopy
[J. Chem. Phys. 151, 214201 \(2019\)](#).
- [10] Y. Lan, B. Dringoli, D. A. Valverde-Chavez, M. Sutton, Y. He, M. Kanatzidis, and **D. G. Cooke**
Ultrafast correlated charge and lattice motion in a hybrid metal halide perovskite
[Science Advances, 5, eaaw5558 \(2019\)](#).
- [11] M. R. Otto, L. P. Rene de Cotret, D. Valverde-Chavez, K. Tiwari, N. Emond, M. Chaker, **D. G. Cooke** and B. J. Siwick
How optical excitation controls the structure and properties of vanadium dioxide
[Proc. Nat. Acad. Sci. 116, 450 \(2019\)](#).
- [12] F. Blanchard, J. E. Nkeck, D. Matte, R. Nechache and **D. G. Cooke**
A low cost terahertz camera
[Appl. Sci. 9, 2531 \(2019\)](#).
- [13] N. Chamanara, **D. G. Cooke** and C. Caloz
Linear pulse compansion based on space-time modulation
[IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, 239-240 \(2019\)](#).
- [14] L. Gingras, W. Cui, J.- M. Ménard and **D. G. Cooke**
Active phase control of terahertz pulses using a dynamic waveguide
[Optics Exp. 26, 13876 \(2018\)](#).
- [15] L. Gingras and **D. G. Cooke**
Direct Temporal Shaping of Terahertz Pulses
[Optica 4, 1416 \(2017\)](#).
- [16] Y. B. Lu, X. Kong, X. Chen, **D. G. Cooke** and H. Guo
Piezoelectric scattering limited mobility of hybrid organic-inorganic perovskites $CH_3NH_3PbI_3$
[Scientific Reports 7, 41860 \(2017\)](#).
- [17] D. A. Valverde-Chávez, and **D. G. Cooke**
Monochromatic Terahertz Emission from β -Barium Borate
[J. Infrared Milli. Terahz Waves 38, 96 \(2017\)](#).

- [18] S. Kostina, M. Hanson, P. Weng, J. Peters, D. A. Valverde-Chávez, P. Chen, **D. G. Cooke**, M. G. Kanatzidis and B. Wessels
Charge Transport Mechanisms in $Pb_2P_2Se_6$ Semiconductor
[ACS Photonics **3**, 1877 \(2016\)](#).
- [19] L. Gingras, F. Blanchard and **D. G. Cooke**
Dynamic creation of a light-induced terahertz guided-wave resonator
[Opt. Express **24**, 2496 \(2016\)](#)
- [20] H. Razavipour, W. Guermoune, M. Hilke, I. Al-Naib, M. M. Dignam, F. Blanchard, H. A. Hafez, X. Chai, D. Ferachou, P. L. Levesque, R. Martel, T. Ozaki and **D. G. Cooke**
High-field response of gated graphene at terahertz frequencies
[Phys. Rev. B **92**, 245421 \(2015\)](#).
- [21] D. A. Valverde-Chávez, C. S. Ponseca Jr., C. C. Stoumpos, A. Yartsev, M. G. Kanatzidis, V. Sundström, and **D. G. Cooke**
Intrinsic femtosecond charge generation dynamics in single crystal $CH_3NH_3PbI_3$
[Energy. Environ. Sci. **8**, 3700 \(2015\)](#)
- [22] H. A. Hafez, I. Al-Naib, M. M. Dignam, Y. Sekine, K. Oguri, F. Blanchard, **D. G. Cooke**, S. Tanaka, F. Komori, H. Hibino, T. Ozaki
Nonlinear terahertz field-induced carrier dynamics in photoexcited monolayer graphene
[Phys. Rev. B **91**, 035422 \(2015\)](#)
- [23] M. Shalaby, M. Peccianti, **D. G. Cooke**, C. P. Hauri and R. Morandotti
Temporal and spectral shaping of broadband THz pulses in a photoexcited semiconductor
[Appl. Phys. Lett. **106**, 051110 \(2015\)](#)
- [24] H. A. Hafez, I. Al-Naib, K. Oguri, Y. Sekine, M. M. Dignam, A. Ibrahim, **D. G. Cooke**, S. Tanaka, F. Komori, H. Hibino and T. Ozaki
Nonlinear transmission of an intense terahertz field through monolayer graphene
[AIP. Advances **4**, 117118 \(2014\)](#)
- [25] F. Blanchard, B. E. Schmidt, X. Ropagnol, N. Thiré, T. Ozaki, R. Morandotti, F. Légaré and **D. G. Cooke**
Terahertz pulse generation from bulk GaAs by a tilted-pulse-front excitations at $1.8\mu\text{m}$
[Appl. Phys. Lett. **105**, 241106 \(2014\)](#)
- [26] F. Blanchard, X. Ropagnol, H. Hafez, H. Razavipour, M. Bolduc, T. Ozaki and **D. G. Cooke**
Effect of extreme pump pulse reshaping on intense terahertz emission in lithium niobate at multimillijoule pump energies
[Opt. Lett. **39**, 4333 \(2014\)](#)
- [27] F. Blanchard, K. Sumida, C. Wolpert, M. Tsotsalas, A. Doi, T. Tanaka, **D. G. Cooke**, S. Furukawa, S. Kitagawa and K. Tanaka
THz phase contrast imaging of sorption kinetics in porous coordination polymer nanocrystals
[Opt. Express **22**, 11061 \(2014\)](#)
- [28] L. Gingras, M. Georgan and **D. G. Cooke**
Optically-induced mode coupling and interference in a terahertz parallel plate waveguide
[Opt. Lett. **39**, 1807 \(2014\)](#)

- [29] **D. G. Cooke**, P. Uhd Jepsen, J. Y. Lek, Y. M. Lam, F. Sy and M. M. Dignam
Picosecond dynamics of internal exciton transitions in CdSe nanorods
[Phys. Rev. B **88**, 241307\(R\) \(2013\)](#)
- [30] I. Al-Naib, G. Sharma, M. M. Dignam, H. Hafez, A. Ibrahim, **D. G. Cooke**, T. Ozaki and R. Morandotti
Effect of local field enhancement on the nonlinear terahertz response of a silicon-based metamaterial
[Phys. Rev. B **88**, 195203 \(2013\)](#)
- [31] **D. G. Cooke**, A. Meldrum and P. Uhd Jepsen
Ultrabroadband terahertz conductivity of Si nanocrystal films
[Phys. Rev. B **101**, 211107 \(2012\)](#)
- [32] J. C. Due Buron, D. Petersen, P. Bøggild, **D. G. Cooke**, M. Hilke, J. Sun, E. Whiteway, P. Nielson, O. Hansen, A. Yurgens and P. Uhd Jepsen
Graphene conductance uniformity mapping
[Nano. Lett. **12**, 5074 \(2012\)](#)
- [33] G. Sharma, I. Al-Naib, H. Hafez, R. Morandotti, **D. G. Cooke** and T. Ozaki
Carrier density dependence of the nonlinear absorption of intense THz radiation in GaAs
[Opt. Express **20**, 18016 \(2012\)](#)
- [34] **D. G. Cooke**, F. C. Krebs and P. Uhd Jepsen
Direct sub-100 fs observation of mobile charge generation in a polymer bulk heterojunction film
[Phys. Rev. Lett. **108**, 056603 \(2012\)](#)
- [35] C. Larsen, **D. G. Cooke**, and P. Uhd Jepsen
Finite difference time domain analysis of time-resolved terahertz spectroscopy experiments
[J. Soc. Am. B **28**, 1308 \(2011\)](#)
- [36] L. V. Titova, T. L. Cocker, **D. G. Cooke**, X. Y. Wang, C. Blois, A. Meldrum and F. A. Hegmann
Ultrafast percolation dynamics in silicon nanocrystal films
[Phys. Rev. B **83**, 085403 \(2011\)](#)
- [37] P. Uhd Jepsen, **D. G. Cooke** and M. Koch
Terahertz spectroscopy and imaging - Modern techniques and applications
[Laser Photonics Rev. **5**, 124 \(2011\)](#)
- [38] K. Iwaszczuk, **D. G. Cooke**, M. Fujiwara, H. Hashimoto and P. Uhd Jepsen
Simultaneous reference and differential waveform acquisition in time-resolved terahertz spectroscopy
[Opt. Express **17**, 21969 \(2009\)](#)
- [39] U. Møller, **D. G. Cooke**, K. Tanaka and P. Uhd Jepsen
Terahertz reflection spectroscopy of Debye relaxation in polar liquids
[J. Opt. Soc. Am. B **26**, A113 \(2009\)](#)
- [40] **D. G. Cooke** and P. Uhd Jepsen
Dynamic and optically induced planar terahertz quasioptics
[Appl. Phys. Lett. **94**, 241118 \(2009\)](#)

- [41] **D. G. Cooke** and P. Uhd Jepsen
Time-resolved THz spectroscopy in a parallel plate waveguide
Phys. Stat. Sol. C **206** 997 (2009)
- [42] **D. G. Cooke** and P. Uhd Jepsen
Optical modulation of terahertz pulses in a parallel plate waveguide
Opt. Express **16**, 15123 (2008)
- [43] **D. G. Cooke**, Yu. I. Mazur, Zh. M. Wang, W. Black, H. Wen, T. D. Mishima, G. D. Lian, G. J. Salamo, M. B. Johnson and F. A. Hegmann
Ultrafast carrier capture dynamics in InGaAs/GaAs quantum wires
J. Appl. Phys. **103**, 023710 (2008)
- [44] **D. G. Cooke**, A. N. MacDonald, A. Hryciw, J. Wang, Q. Li, A. Meldrum and F. A. Hegmann
Ultrafast terahertz conductivity of photoexcited nanocrystalline silicon
J. Mat. Sci. **18**, 447 (2007)
- [45] M. Walther, **D. G. Cooke**, C. Sherstan, M. Hajar, M. R. Freeman and F. A. Hegmann
Terahertz conductivity of thin gold films at the metal-insulator percolation transition
Phys. Rev. B **76**, 125408 (2007)
- [46] **D. G. Cooke**, E. C. Young, T. Tiedje and F. A. Hegmann
Electron mobility in dilute GaAs bismide and nitride alloys from time-resolved terahertz spectroscopy
Appl. Phys. Lett. **89**, 122103 (2006)
- [47] **D. G. Cooke**, A. N. MacDonald, A. Hryciw, J. Wang, Q. Li, A. Meldrum and F. A. Hegmann
Transient terahertz conductivity in photoexcited silicon nanocrystal films
Phys. Rev. B **73**, 193311 (2006)
- [48] O. Ostroverkhova, **D. G. Cooke**, S. R. Parkin, R. R. Tykwinski, J. E. Anthony and F. A. Hegmann
Anisotropy of transient photoconductivity in functionalized pentacene single crystals
Appl. Phys. Lett. **89**, 192113 (2006)
- [49] O. Ostroverkhova, **D. G. Cooke**, F. A. Hegmann, J. E. Anthony, V. Podzorov, M. E. Gershenson, O. D. Jurchescu and T. T. M. Palstra
Ultrafast carrier dynamics in pentacene, functionalized pentacene, tetracene and rubrene single crystals
Appl. Phys. Lett. **88**, 162101 (2006)
- [50] H. E. Ruda, J. C. Polanyi, S. Y. Yang, Z. Wu, U. Philipose, T. Xu, S. Yang, K. L. Kavanagh, J. Q. Liu, L. Wang, Y. Wang, K. Robbie, J. Yang, K. Kaminska, **D. G. Cooke**, F. A. Hegmann, A. J. Budz and H. H. Haugen
Developing 1D nanostructure arrays for future nanophotonic devices
Nanoscale Res. Lett. **1**, 6 (2006)
- [51] O. Ostroverkhova, **D. G. Cooke**, S. Shcherbyna, R. F. Egerton, F. A. Hegmann, R. R. Tykwinski, J. E. Anthony
Bandlike transport in pentacene and functionalized pentacene thin films revealed by sub-picosecond transient photoconductivity measurements
Phys. Rev. B **71**, 035204 (2005)

- [52] O. Ostroverkhova, S. Shcherbyna, **D. G. Cooke**, R. F. Egerton, F. A. Hegmann, R. R. Tykwinski, S. R. Parkin and J. E. Anthony
Optical and transient photoconductive properties of pentacene and functionalized pentacene thin films: Dependence on film morphology
[J. Appl. Phys. **98**, 033701 \(2005\)](#)
- [53] **D. G. Cooke**, Yu. I. Mazur, W. Q. Ma, X. Wang, Z. M. Wang, G. J. Salamo, M. Xiao, T. D. Mishima, M. B. Johnson and F. A. Hegmann
Anisotropic photoconductivity of InGaAs quantum dot chains measured by terahertz pulse spectroscopy
[Appl. Phys. Lett. **85**, 3839 \(2004\)](#)

1.3 Published Conference Proceedings

- [53] A. W. Schiff-Kearn and **D. G. Cooke**
Catching a Terahertz Pulse in a Photonic Crystal Net Triggers Dynamic Frequency Conversion
[2023 48th International Conference on Infrared, Millimeter and Terahertz Waves \(IRMMW-THz\), Montreal, Canada.](#)
- [54] B. J. Dringoli, M. Sutton, Z. Luo, M. G. Kanatzidis and **D. G. Cooke**
Photoinduced phase change in SnSe probed by ultrafast multi-THz spectroscopy
[2022 47th International Conference on Infrared, Millimeter and Terahertz Waves \(IRMMW-THz\), Delft, NL **Prize for student presentations: 2nd place.**](#)
- [55] N. Chamarara, A. W. Schiff-Kearn, J. Menard and **D. G. Cooke**
Terahertz Pulse Trapping Beyond the Delay-Bandwidth Limit
[2019 44th International Conference on Infrared, Millimeter, and Terahertz Waves \(IRMMW-THz\), Paris, France, 1 \(2019\).](#)
- [56] L. Gingras, W. Cui, A. W. Schiff-Kearn, J. M. Ménard and **D. G. Cooke**
All-optical phase control of THz waveforms
[IRMMW-THz 2018, Nagoya, Japan.](#)
- [57] L. Gingras, F. Blanchard and **D. G. Cooke**
All-optical platform for THz pulse-shaping
[Infrared, Millimeter and Terahertz Waves \(IRMMW-THz\), Copenhagen, pp. 1-2 \(2016\).](#)
- [58] L. Gingras, M. Gingras and **D. G. Cooke**
Dynamic light-induced THz resonators in a waveguide
[CLEO: Science & Innovations, San Jose, STu1H.2 \(2015\)](#)
- [59] D. A. Valverde-Chávez, C. Ponseca Jr., C. C. Stoumpos, A. Yartsev, M. G. Kanatzidis, V. Sundström and **D. G. Cooke**
Optical Pump-Multi-THz Probe Spectroscopy of a Single Crystal Organic Hybrid Lead Halide Perovskite
[CLEO: Science & Innovations, San Jose, JW2A.50 \(2015\)](#)
- [60] H. Razavipour, W. Yang, F. Blanchard, A. Guermoune, M. Hilke and **D. G. Cooke**
Nonlinear THz transmission of gated graphene
[CLEO: Science & Innovations, San Jose, STu2H.2 \(2015\)](#)

- [61] H. A. Hafez, I. Al-Naib, M. M. Dignam, Y. Sekine, K. Oguri, F. Blanchard, **D. G. Cooke**, S. Tanaka, F. Komori, H. Hibino, T. Ozaki
Effects of photoexcitation on intense terahertz field-induced nonlinearity in monolayer epitaxial graphene
CLEO: Science & Innovations, San Jose, JW2A.63 (2015)
- [62] H. Razavipour, W. Yang, D. A. Valverde-Chávez, E. Whiteway, F. Blanchard, M. Hilke and **D. G. Cooke**
Broadband terahertz spectroscopy of electrically gated graphene
CLEO: Science & Innovations, San Jose, ST1F.8 (2014)
- [63] F. Blanchard, H. Razavipour, H. Hafez, M. Bolduc, R. Morandotti, T. Ozaki and **D. G. Cooke**
Scaling up of intense terahertz pulses pumped with 800 nm light pulses
CLEO: Science & Innovations, San Jose, SW1F.4 (2014)
- [64] F. Blanchard, K. Sumida, C. Wolpert, M. Tsotsalas, T. Tanaka, A. Doi, S. Kitagawa, **D. G. Cooke**, S. Furukawa and T. Tanaka
Terahertz near-field phase contrast imaging
CLEO: Science & Innovations, San Jose, STh4F.5 (2014)
- [65] D. A. Valverde-Chávez and **D. G. Cooke**
Narrowband terahertz emission from beta-barium borate
CLEO: Science & Innovations, San Jose, JW2A.64 (2014)
- [66] T. Wang, K. Iwaszczuk, **D. G. Cooke** and P. Uhd Jepsen
Time-resolved broadband terahertz relaxation dynamics of electron in water
[Int. Conf. on Infrared, Millimeter and Terahertz Waves \(2014\)](#)
Note: T. Wang was a co-supervised PhD student in Denmark with Prof. P. Uhd Jepsen.
- [67] I. Al-Naib, G. Sharma, M. M. Dignam, H. Hafez, A. Ibrahim, **D. G. Cooke**, T. Ozaki and R. Morandotti
Towards nonlinear terahertz metamaterials
CLEO: Science & Innovations, San Jose, CM4J.7 (2013)
- [68] I. Al-Naib, G. Sharma, M. M. Dignam, **D. G. Cooke**, T. Ozaki and R. Morandotti
Ultrafast nonlinear terahertz metamaterials
[Frontiers in Optics, Rochester, FW2E \(2012\)](#)
- [69] M. Clerici, M. Peccianti, M. Shalaby, T. Ozaki, **D. G. Cooke**, D. Faccio and R. Morandotti
Enhanced detection of broadband terahertz fields via the filamentation of chirped optical pulses
CLEO: Science & Innovations, San Jose, CM2L.6 (2012)
- [70] R. Malureanu, P. Uhd Jepsen, S. Ziao, L. Zhou, **D. G. Cooke**, A. Andryieuski and A. Lavrinenko
Fractal THz metamaterials: design, fabrication and characterisation
Metamaterials V, Proc. of SPIE, Brussels, vol. 7711, 77110M (2010)
- [71] **D. G. Cooke**, J. Y. Lek, F. C. Krebs, Y. M. Lam and P. Uhd Jepsen
Time-resolved terahertz spectroscopy of conjugated polymer/CdSe nanorod composites
[Ultrafast Phenomena in Semiconductors and Nanostructured Materials XIV, Proc. of SPIE, San Francisco, vol. 7600, 7600H \(2010\)](#)

- [72] H. Porte, D. Turchinovich, **D. G. Cooke** and P. Uhd Jepsen
Terahertz study of ultrafast carrier dynamics in InGaN/GaN multiple quantum wells
[Journal of Physics: Conference Series **193** 1, 2009.](#)
- [73] H. Porte, D. Turchinovich, **D. G. Cooke** and P. Uhd Jepsen
Transient photoconductivity in InGaN/GaN multiple quantum wells, measured by time-resolved terahertz spectroscopy
[IEEE LEOS Annual Meeting Conference Proceedings \(2009\)](#)
- [74] U. Møller, J. K. Jensen, **D. G. Cooke** and P. Uhd Jepsen
Investigation of liquids and solids with THz time-domain spectroscopy
 IEICE Technical Report, **184** (2008)
- [75] F. A. Hegmann, **D. G. Cooke** and M. Walther
Terahertz spectroscopy of ultrafast carrier dynamics in nanomaterials
[33rd International Conference on Infrared, Millimeter and Terahertz Waves \(2008\)](#)
- [76] **D. G. Cooke**, A. N. MacDonald, A. Hryciw, A. Meldrum, F. A. Hegmann, Y. I. Mazur, H. Wen, Q. Q. Ma, X. Wang, Z. M. Wang, G. J. Salamo, M. Xiao, T. D. Mishima, G. D. Lian, J. Keay, M. B. Johnson, J. Wang, Q. Li, Z. H. Wu, C. DeSouza and H. E. Ruda
Probing ultrafast carrier dynamics in semiconductor nanostructures with terahertz pulses
[IEEE Lasers and Electro-Optics Society, 244-245 \(2005\)](#)
- [77] O. Ostroverkhova, S. Shcherbyna, **D. G. Cooke**, R. Egerton, R. R. Tykwinski, J. E. Anthony and F. A. Hegmann
Fast photoresponse in organic semiconductors: understanding the mechanisms and structure-property relationships
[Proc. SPIE vol **5517**, p. 163-174, Linear and Nonlinear Optics of Organic Materials IV; Eds. R. A. Norwood, M. Eich, M. G. Kuzyk \(2004\)](#)

1.4 Book chapters

- [72] **D. G. Cooke**
[Terahertz photoconductivity](#)
 Photoconductivity and Photoconductive Materials Fundamentals, Techniques and Applications, J. Wiley & Sons (2022).
- [73] K. Iwaszczuk, R. K. Olsson, **D. G. Cooke**, D. Turchinovich and P. Uhd Jepsen
Terahertz technology: terahertz sources and detectors. Beyond optical horizons, today and tomorrow with photonics
- [74] **D. G. Cooke**, D. Turchinovich, U. Møller, F. Eichorn and P. Uhd Jepsen
Nyt lys pøa ukendt land: Terahertz teknologi, Optiske Horisonter
[ISBN: 87-92062-01-6, COM-DTU, Odense \(2007\)](#)
- [75] F. A. Hegmann, O. Ostroverkhova and **D. G. Cooke**
Probing organic semiconductors with terahertz pulses
[Photophysics of Molecular Materials: From Single Molecules to Single Crystals, Ed. Guglielmo Lanzani, VCH Wiley \(2006\)](#)

1.5 Invited seminars, lectures and colloquia

I include all invited and keynote talks, lectures and colloquia I have given since arriving at McGill in January of 2011. Since 2022, a biweekly child custody schedule reduces my ability to attend many conferences.

1. **April 2025:** *Electronic and structural coherent dynamics observed by time-resolved THz spectroscopy*
2025 MRS Spring Meeting, Seattle, WA, USA.
2. **Aug 2024:** *Ultrafast light-induced phase transition in tin selenide sensed by time-resolved terahertz spectroscopy*
32nd International Materials Research Congress 2024, Cancun, Mexico.
3. **Aug 2024:** *declined due to conflict of schedule*
SPIE Optics + Photonics, San Diego, CA USA.
4. **June 2023:** *Photoinduced phase change in the thermoelectric material SnSe observed via time-resolved THz spectroscopy*
Photonics North, Montreal.
5. **May 2022:** *Charge-lattice correlations probed by ultrabroadband THz spectroscopy*
MRS Spring Meeting, virtual.
6. **18 April 2021:** *Coherent polaron dynamics in the lead halide perovskites*
Optical THz Science and Technology 2021, Hungary.
7. **11 Nov 2020:** *Time-resolving correlated atomic and electronic motion using THz spectroscopy*
IRMMW-THz 2020, Buffalo (virtual), PLENARY.
8. **3 Feb 2020:** *Coherent polaron dynamics in the lead halide perovskites*
SPIE Photonics West, San Francisco.
9. **14 Jan 2019:** *Measurement and control of electron dynamics using THz pulses*
McMaster University, Hamilton, ON - Physics seminar.
10. **31 Jan 2019:** *Measurement and control of electron dynamics using THz pulses*
University of British Columbia, Vancouver, BC - Physics seminar.
11. **15 Feb 2019:** *Measurement and control of electron dynamics using THz pulses*
Technical University of Denmark, Dept. of Photonics Eng. seminar.
12. **19 Feb 2019:** *Coherent THz response of polarons in hybrid lead halide perovskites*
University College of London, McGill-UCL-Tokyo Joint Workshop.
13. **12 March 2019:** *Ultrafast THz Light-Matter Interactions*
Queen's University, Kingston, ON - Physics seminar.
14. **29 March 2019:** *Dynamic THz Photonics*
Queen's University, Kingston, ON - Physics seminar.
15. **25 Apr 2019:** *Ultrafast THz Light-Matter Interactions*
University of Alberta, Edmonton, AB - Physics seminar.

16. **7 May 2019:** *Optical Terahertz Science and Technology*
CLEO Short Course.
17. **25 Nov 2018:** *Multi-THz spectroscopy of single crystal organometallic halide perovskites: polarons and Rashba effects*
MRS Fall Meeting, Boston, USA.
18. **Aug 19, 2018:** *Band edge excitations in $CH_3NH_3PbI_3$ probed by time-resolved multi-THz spectroscopy*
SPIE Optics and Nano 2018, San Diego USA.
19. **6 June 2018:** *Advanced THz Pulse Shaping and Applications*
Photonics North 2018, Montreal, QC.
20. **11 June 2018:** *Measurement and control of electron dynamics using THz light fields*
Canadian Association of Physicists Congress 2018, Halifax, NS Canada.
21. **17 June 2018:** *Sub-picosecond dynamics at the band edges of OMHPs*
Electronic and Structural Dynamics in Hybrid Perovskites: Theory Meets Experiment, Telluride, CO, USA.
22. **9 Sept 2018:** *Ultrafast THz pulse shaping and nonlinear spectroscopy*
IRMMW-THz, Nagoya, Japan.
23. **30 Nov 2017:** *Temporal shaping of THz pulses and applications for coherent control*
University of Ottawa Department of Physics Seminar.
24. **29 Aug 2017:** *Arbitrary Shaping Of Terahertz Pulses Using Light-Induced Photonic Structures*
IRMMW-THz 2017, Cancun, Mexico.
25. **14 May 2017:** *Ultrafast photophysics of single crystal metal-organic halide perovskites measured by transient multi-THz spectroscopy*
CLEO 2017, San Jose, USA.
26. **25 September 2016:** *Keynote - Declined due to birth of child (See Appendix ??)*
IRMMW-THz 2016, Copenhagen, Denmark.
27. **2 October 2016:** *Invited - Declined due to birth of child (See Appendix ??)*
TeraNano VII, Porquerolles, France.
28. **3 February 2016:** *Terahertz Spectroscopy of Condensed Matter: From Photovoltaics to High Field Physics*
Trent University, Peterborough, ON, Canada.
29. **6 June 2016:** *Optical THz Science and Technology*
CLEO Short Course, CLEO 2016, San Jose, USA.
30. **14 June 2015:** *Ultrafast dynamics of mobile charges and excitons in hybrid lead halide perovskites*
CAP Congress 2015, Edmonton, AB, Canada.
31. **10 May 2015:** *Optical THz Science and Technology*
CLEO Short Course, CLEO 2015, San Jose, USA.

32. **10 December 2015:** *Multi-THz spectroscopy of ultrafast charge transport processes in materials*
Brown University, Providence, RI, USA.
33. **8 December 2015:** *Multi-THz spectroscopy of ultrafast charge transport processes in materials*
Worcester Polytechnic Institute, Worcester, MA, USA.
34. **15 October 2015:** *A THz view of condensed matter*
University of Alberta, Edmonton, AB, Canada.
35. **10 May 2015:** *Ultra-broadband terahertz spectroscopy of organometallic trihalide perovskites*
Canadian Semiconductor Science and Technology Conference, Sherbrooke, QC, Canada.
36. **20 & 22 August 2014:** *Introduction: Ultrafast Terahertz Science and Technology & A THz View of Condensed Matter*
Regroupement Québécois Étudiant sur les Matériaux de Pointe summer school (two lectures), Orford, QC.
37. **1 December 2014:** *Exciton dynamics in quantum dots and rods probed with multi-THz spectroscopy*
TeraNano V, Fort-de-France, Martinique.
38. **16 June 2014:** *THz photonics and spectroscopy on ultra-short time scales*
CREER Annual Meeting, Montreal, QC, Canada.
39. **14 May 2014:** *New Developments in THz Science and Technology*
Next Generation Solar Conference / RQMP Annual Meeting, Montreal, QC, Canada.
40. **30 May 2014:** *Time-resolved Multi-THz Spectroscopy of Colloidal CdSe Nanorods*
Photonics North 2014, Montreal, QC, Canada.
41. **22 September 2014:** *Low energy electrodynamics on ultra-fast time scales*
Concordia University, Montreal, QC, Canada.
42. **24 Aug 2013:** *Time-resolved multi-THz spectroscopy of excitonic systems: Polymers and nanoparticles*
SPIE Physical Chemistry of Interfaces and Nanomaterials XII, San Diego, CA, USA.
43. **27 May 2013:** *Field-resolved multi-THz spectroscopy: meV spectra with sub-100 fs resolution*
CAP Congress 2013, Montreal, QC, Canada.
44. **1 April 2013:** *Time-resolved multi-THz spectroscopy of disordered nanoscale systems*
OTST 2013, Kyoto, Japan.
45. **24 July 2012:** *Sub-ps THz Spectroscopy of a Polymer Bulk Heterojunction Film*
Int. Laser Physics Workshop, Calgary, AB, Canada.
46. **17 June 2012:** *Sub-picosecond THz spectroscopy of polymer bulk heterojunction films*
European Optical Society Meeting, Prague, Czech Republic.

47. **3 June 2012:** *Ultra-broadband THz spectroscopy revealing sub-picosecond mobile charge dynamics in conjugated polymers*
ICOOPMA 2012, Nara, Japan.
48. **20 September 2012:** *Ultrafast THz Spectroscopy and Photonics*
Boston University, Boston, MA, USA.
49. **23 February 2012:** *Sub-100 fs THz photoconductivity of polymer solar cells: Creation of mobile charges*
University of Ottawa, Ottawa, ON, Canada.
50. **27 June 2011:** *Terahertz Sources and Applications*
Extreme Photonics Summer School, University of Ottawa, Ottawa, Canada.
51. **15 May 2011:** *Time-resolved ultra-broadband terahertz spectroscopy*
Photonics North 2011, Ottawa, ON, Canada.
52. **8 February 2011:** *Ultrafast and Ultrabroadband Terahertz Spectroscopy*
INRS, Varennes, QC, Canada.

1.6 Student conference presentations (oral)

1. M. J. Maher, C. M. Lund, J. Bancheri, **D. G. Cooke** and J. Seuntjens
Study of Annular Parallel Plate Waveguides for a Dielectric Wall Accelerator
2023 Canadian Association of Physics Congress, Fredericton, NB, Canada.
2. M. J. Maher, C. M. Lund, A. Giang Bui, J. Bancheri, P. Jung, A. Krasnykh, T. Craig, T. Planche, T. Purdie, R. Baartman, **D. G. Cooke** and J. Seuntjens
Development status of the dielectric wall accelerator for accessible proton therapy
2023 FLASH Radiotherapy & Particle Therapy Conference, Toronto, ON, Canada
3. M. J. Maher, C. M. Lund, J. Bancheri, J. Yuan, A. Currell, **D. G. Cooke** and J. Seuntjens
Characterization of discretely excited radial parallel plate transmission lines for use in a dielectric wall accelerator
2024 ASM, Regina, SK, Canada
4. D. Matte, L. Gingras, L. Rene de Cotret, M. Sutton, B. J. Siwick and **D. G. Cooke**
Sub-cycle THz field emission of electrons from a tungsten nanotip IRMMW-THz 2020, Buffalo, USA (moved to virtual)
5. D. Matte, L. Gingras, L. Rene de Cotret, M. Sutton, B. J. Siwick and **D. G. Cooke**
Ultrafast THz field emission of electrons from a tungsten nanotip Optical Terahertz Science and Technology 2019, Sante Fe, NM, USA
6. D. Matte, L. Gingras, L. Rene de Cotret, B. J. Siwick and **D. G. Cooke**
Electron field emission and nanotip conditioning by intense single cycle THz pulses Photonics North 2019, Quebec, QC, Canada
7. A. W. Schiff-Kearn, L. Gingras, S. Bernier, N. Chamanara, K. Agarwal, J. -M. Ménard and **D. G. Cooke**
Steering the Slipstream: Moving Fronts to Tailor Terahertz Pulses CLEO 2021, (moved to virtual)

8. A. W. Schiff-Kearn, L. Gingras, S. Bernier, N. Chamanara, K. Agarwal, J. -M. Ménard and **D. G. Cooke**
Tailoring terahertz pulses with moving fronts: temporal stretching and time-reversal
IRMMW-THz 2020, Buffalo, NY, USA (moved to virtual)
9. Y. Lan, X. Tao, X. Kong, Y. He, X. Zheng, M. Sutton, M. G. Kanatzidis, H. Guo and **D. G. Cooke**
Coherent charge-lattice coupling and exciton dynamics in orthorhombic $CH_3NH_3PbI_3$
MRS Fall Meeting 2019, Boston, MA, USA
10. Y. Lan, B. J. Dringoli, D. A. Valverde-Chavez, C. S. Ponseca Jr., Y. He, M. G. Kanatzidis, M. Sutton and **D. G. Cooke**
Coherent formation of polarons in a hybrid organic-inorganic perovskite
Optical Terahertz Science and Technology 2019, Santa Fe, NM, USA (**Best student talk prize**)
11. Y. Lan, B. J. Dringoli, D. A. Valverde-Chavez, C. S. Ponseca Jr., Y. He, M. G. Kanatzidis, M. Sutton and **D. G. Cooke**
Coherent oscillations in the THz response of single crystal methylammonium lead triiodide
Photonics West 2019, San Francisco, CA, USA
12. L. Gingras, A. W. Schiff-Kearn, J. -M. Ménard and **D. G. Cooke**
Dynamic arbitrary THz pulse shaping
Optical Terahertz Science and Technology 2019, Santa Fe, NM, USA
13. D. A. Valverde-Chávez, C. Ponseca Jr., C. C. Stoumpos, M. G. Kanatzidis and **D. G. Cooke**
Ultrafast multi-THz Spectroscopy of a Single Crystal Hybrid Metal-Organic Halide Perovskite
[Optical Probes, Quebec City \(2017\)](#)
14. L. Gingras and **D. G. Cooke** (Best Poster Prize)
Programmable dynamic THz photonic components in a planar waveguide
Optical THz Science and Technology Workshop, Kyoto, Japan, (2013) **Best student presentation award**
15. J. D. Buron, D. H. Pedersen, P. Bøggild, **D. G. Cooke**, J. Sun, M. Hilke, E. Whiteway, O. Hansen, P. F. Nielsen, A. Yurgens and P. Uhd Jepsen
Terahertz and M4PP conductivity mapping of large area CVD grown graphene films
3rd European Optical Society: IRMMW-THz Waves topical meeting, Czech Republic (2012)

1.7 Student conference presentations (poster)

1. R. T. Paulino, B. Colmey and **D. G. Cooke**
Spatiotemporal walkoff in focused air plasma THz sources
Optical Terahertz Science and Technology 2024, Marburg, Germany
2. B. Colmey, R. T. Paulino and **D. G. Cooke**
Plasma generated THz driven electron emission
Optical Terahertz Science and Technology 2024, Marburg, Germany
3. B. J. Dringoli, Z. Luo, M. Sutton, M. Kanatzidis and **D. G. Cooke**
Polaron formation dynamics in SnSe probed by transient multi-THz spectroscopy
Ultrafast Phenomena 2022, Montreal, Canada

4. D. Matte, L. Gingras, L. Rene de Cotret, B. J. Siwick and D. G. Cooke
Ultrafast THz field emission of electrons from a metal nanotip
Optical Terahertz Science and Technology 2017, Nagoya, Japan

5.

1.8 Patents

1. **D. G. Cooke**
All-optical control of THz wave propagation
[Patent US8433170](#)