

Amina E. Hussein, PhD

University of Alberta, Department of Electrical & Computer Engineering
11-368 Donadeo Innovation Centre for Engineering, 9211-116 Street, Edmonton AB T6G 2H5
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RESEARCH INTERESTS

Experiments and numerical modelling of intense laser-matter interactions: relativistic electron acceleration, laser wakefield acceleration, ion acceleration; the generation and application of laser-driven X-rays, gamma-rays, infrared pulses and high-order harmonic generation; laser induced breakdown spectroscopy.

EDUCATION

Ph.D. Applied Physics University of Michigan, Ann Arbor, MI, USA 2015 - 2019
Advisor: [Prof. Karl Krushelnick](#) & [Prof. Louise Willingale](#)
Dissertation title: *Laser-driven electron accelerators as a broadband radiation source*
M.S. Nuclear Engineering Purdue University, West Lafayette, IN, USA 2013 - 2015
Advisor: [Prof. Ahmed Hassanein](#)
B.Sc. Honours Physics McGill University, Montréal, QC, Canada 2008 - 2013
Honours thesis advisor: [Prof. Mark Sutton](#)

POSITIONS

Canada Research Chair in Laser-Plasma Based Diagnostics 05/2023 - Present
University of Alberta, Edmonton, AB, Canada
Assistant Professor, Department of Electrical & Computer Engineering 07/2020 - Present
University of Alberta, Edmonton, AB, Canada
Adjunct Professor, Graduate Studies and Research 10/2022 - 08/2027
Faculty of Engineering and Applied Science, University of Regina, Regina, SK, Canada
UC President's Postdoctoral Fellow, Department of Physics & Astronomy 07/2019 - 06/2020
University of California, Irvine, CA, USA
Research Aide, Argonne Leadership Computing Facility 06/2015 - 08/2015
Argonne National Laboratory, Lemont, IL, USA
Visiting Scholar, Department of Nuclear Engineering 05/2012 - 08/2012
Purdue University, West Lafayette, IN, USA
Research Assistant, Department of Neurology & Neurosurgery 05/2011 - 08/2011
McGill University, Montréal, QC, Canada

FUNDING

Total external funding awarded as PI: \$2,759,798 CAD

Total external funding award as Co-PI: \$2,043,700 CAD

AWARDED (N=18)

18. Canada Research Chair, Tier 2

05/2023 - 05/2029 **Laser-Plasma Based Diagnostics**

PI: A. E. Hussein

Amount: \$600,000 CAD

17. NSERC Research Tools and Instruments

04/2023-03/2024

High-repetition rate particle acceleration end-station for ultrafast science

PI: A. E. Hussein

Amount: \$141,739 CAD

16. NSERC Collaborative Research and Training Experience (CREATE) program

09/2023-08/2029

Training in Ultrafast Science and Technology (TrUST)

PI: F. Légaré (INRS)

Co-Applicants: A. E. Hussein, D. Strickland (Waterloo), Byung-Kook Ham (USask), David Cooke (McGill), Emile Haddad; Frank Hegmann (UAlberta), Kimberley Hall; Ksenia Dolgaleva; Lora Ramunno; Matt Reid (UNBC), Tsuneyuki Ozaki (INRS)

Amount: \$1,650,000 CAD

15. Canadian Space Agency, CubeSats Initiative in Canada for STEM (CUBICS) 2022

04/2023 - 03/2026

Ex-Alta 3: Measuring Ice and Snow Coverage PI: C. Lange (UAlberta)

Co-PIs: A. E. Hussein, K. Knudsen, M. Lipsett, I. Mann, A. Iyer

Amount: \$348,700 CAD

14. NSERC Alliance - Alberta Innovates Advance Program, Discovery Supplement

03/2023 - 02/2025

New frontiers in intense laser-matter interactions

PI: A. E. Hussein

Amount: \$32,000 CAD

13. University of Alberta and Tecnológico de Monterrey Seed Funding Program 07/2022-06/2023 Small-Scale, High-Impact Digital Solutions and Approaches towards SMEs 4.0

PI: R. Ahmad (UAlberta), A. Román (TEC)

Collaborators: A. E. Hussein (UAlberta), X. Zhang (UAlberta), R. Monroy (UAlberta), D. Romero (TEC), E. Cuan (REC), P. Urbina (TEC), C. Vazquez (TEC)

Amount: \$45,000 CAD

12. US Department of Energy, Fusion Energy Sciences, LaserNetUS

04/2022-06/2023

Investigation of pulsed discharges in water by betatron x-ray imaging

PI: Amina E. Hussein

Co-PIs: A. Hamdan (UMontréal), Jason Myatt (UAlberta), V. Senthilkumaran (UAlberta)

Amount: \$15,772 USD (\$20,504 CAD) + Facility access at the Advanced Laser Light Source at INRS valued at \simeq \$50,000 CAD

11. US Department of Energy, Fusion Energy Sciences, LaserNetUS 04/2022-06/2023

Exploring the role of energetic electrons in volumetric heating of solid-density plasma using high-resolution time-resolved X-ray spectroscopy

PI: Nick Beier (UAlberta)

Co-PI: A. E. Hussein (UAlberta)

Amount: \$41,616 USD (\$54,100 CAD) + Facility access at the Jupiter Laster Facility at Lawrence Livermore National Laboratory valued at \simeq \$150,000 USD

10. NSERC Alliance - Alberta Innovates Advance Program 04/2022-03/2024

Smart in-situ X-ray-based probing system for novel additively manufactured products and materials

PI: Amina E. Hussein

Co-investigators: Rafiq Ahmad (UAlberta)

Amount: \$300,000 CAD

9. Alberta Jobs, Economy and Innovation Small Equipment Grant 02/2022

Smart femtosecond microbeamline for ultrafast applications

PI: Amina E. Hussein

Amount: \$274,649 CAD

8. Western Grains Research Foundation, Saskatchewan Wheat Development Commission

04/2022-03/2025

Laser Induced Breakdown Spectroscopy for efficient germplasm selection of wheat grain attributes

PI: Amina E. Hussein

Collaborators: Jatinder Sangha (Agriculture & Agri-Food Canada), Bin Xiao Fu (Canadian Grain Commission), Srinivas Sura (Agriculture & Agri-Food Canada), Frank Hegmann (UAlberta), A. Bais (URegina)

Amount: \$204,360 CAD

7. Canada Foundation for Innovation, John Evans Leaders Fund 06/2021

Smart femtosecond microbeamline for ultrafast applications

PI: Amina E. Hussein

Amount: \$274,649 CAD

6. NSERC, Discovery Grant 04/2021-04/2027

New frontiers in intense laser-matter interactions

PI: Amina E. Hussein

Amount: \$144,000 + \$12,500 CAD Discovery Launch award

5. Digital Research Alliance of Canada (formerly Compute Canada), Resources for Research Groups Competition

New frontiers in intense laser-matter interactions

PI: Amina E. Hussein

Amount: \$8,069 CAD equivalent cost of resources 04/2023-03/2024 **Amount:** \$14,266 CAD equivalent cost of resources 04/2022-03/2023

Amount: \$14,639 CAD equivalent cost of resources 04/2021-03/2022

4. **US Department of Energy, Fusion Energy Sciences, LaserNetUS** 03/2021-12/2022

High-resolution betatron X-ray imaging of porosity evolution in additively manufactured alloys

PI: Amina E. Hussein

Collaborators: J. Moore (Marquette University), L. Zhou (Marquette University)

Amount: \$86,268 USD (\$105,662.77 CAD) + facility access valued at \simeq \$50,000 CAD

3. **Alberta Innovates Smart Agriculture and Food Digitization and Automation Challenge**
Laser Induced Breakdown Spectroscopy for in-situ soil analysis

03/2021-12/2023

PI: Amina E. Hussein

Collaborators: Frank Hegmann (UAlberta), Miles Dyck (UAlberta), Abdul Bais (URegina)

Amount: \$498,000 CAD + \$430,000 CAD in-kind

2. **Shastri Indo-Canadian Institute, Golden Jubilee Conference and Lecture Series Grant**

02/2021-03/2021

Science and Technology for the New Age - Acquisition, Analysis and Adaptation

Director: Amartya Sengupta (IIT Delhi)

Collaborators: Amina E. Hussein (UAlberta), Aparajita Bandyopadhyay (IIT Delhi)

Amount: 1,10,000 Rs

1. **US Department of Energy, Fusion Energy Sciences, LaserNetUS** 07/2020-12/2021

The role of hot electrons in the generation of anomalous X-ray spectra from ultra-intense laser-plasma interactions

PI: Amina E. Hussein

Collaborators: K. Flippo (LANL), F. Dollar (UCI), L. Gao (PPPL), K. Hill (PPPL), S. Hansen (SNL), R. Shepherd (LLNL)

Amount: \$75,117 USD (\$97,634.15 CAD) + facility access valued at \simeq \$150,000 USD

HONORS AND AWARDS

SCHOLARSHIPS AND PRIZES

Canada Research Chair Tier II (\$600,000 CAD)	2023 - 2028
University of California President's Postdoctoral Fellowship, (\$71,125 USD, faculty hiring incentive)	2019
University of Michigan Rackham Graduate Student Research Grant, (\$3,000 USD)	2019
Michigan Institute for Plasma Science and Engineering Fellowship, (\$4,000 USD)	2018
University of Michigan Marian Sarah Parker Graduate Prize, (\$1,000 USD)	2018
U-M Library Student Mini-Grant, (\$1,000 USD)	2017
SPIE Laser Technology, Engineering and Applications Scholarship, (\$5,000 USD)	2015
NSERC of Canada Postgraduate Doctoral Scholarship, (\$63,000 CAD)	2015 - 2018
UCSD California Research Assistantship Fellowship, (\$50,546 USD, declined)	2015 - 2017
SPIE Optics and Photonics Education Scholarship (\$2 000 USD)	2013

IEEE Nuclear and Plasma Sciences Phelps Grant (<i>\$750 USD</i>)	2013
McGill University Mobility Award, (<i>\$3 000 CAD</i>)	2012

PRESENTATION AWARDS

Best Poster Award, MIPSE Graduate Student Symposium	2018
Outstanding Poster Award, International Committee on Ultrahigh Intensity Lasers Conference	2018
First Place Poster Award, OMEGA Laser Users' Workshop , Rochester, NY	2018
Best Poster Award, OMEGA Laser Users' Workshop , Rochester, NY	2016
Best Poster Award, Conference for Undergraduate Women in Physics , Caltech, Pasadena, CA	2013
Third Prize Talk, Applied Physics, Canadian Undergraduate Physics Conference , Vancouver, BC	2012
Second Prize Poster, McGill Department of Physics Poster Presentations, Montréal, QC	2012

ADDITIONAL HONORS

Institute of Physics Trusted Reviewer Status	2020
Scientific Reports Top 100 Physics Articles in 2019	2020
Invited remarks, University of Michigan Nobel Laureate Lecture featuring Prof. Gérard Mourou	2019
Travel Award, The First Annual Users Meeting of LMJ-Petal	2018
Invited to partake in the 2018 Communicating Science Conference , Michigan	2018
Selected to attend the NNSA/CEA Postdoctoral Exchange Workshop in Paris, FR	2018
Travel Award, Conference for Undergraduate Women in Physics , Caltech	2013
Award to represent McGill University at the Canadian Undergraduate Physics Conference	2012
Departmental nomination to the McGill Faculty of Science Undergraduate Research Conference	2012

PUBLICATIONS

Convention for author order:

1st: Greatest contributions, 2nd/3rd: Significant contributions, Final: Principal investigator.

* denotes supervised students and postdoctoral fellows

REFERRED JOURNAL PUBLICATIONS

[J22] S. Mohajan*, Y. Huang*, N.F. Beier*, M. Dyck, F. Hegmann, A. Bais, **A.E. Hussein**, *The effect of laser wavelength on soil carbon measurement using laser-induced breakdown spectroscopy* [Optics Express](#), [Accepted September 4, 2023 \(501741\)](#)

[J21] Y. Huang*, A. Bais, **A.E. Hussein**, *Domain adaptation using class-balanced self-paced learning for soil classification with LIBS*, *IEEE Transactions on Plasma Science*, [Accepted August 5, 2023](#)

[J20] Y. Huang*, A. Bais, **A.E. Hussein**, *Pseudo-Shot Learning for Soil Classification with Laser-Induced Breakdown Spectroscopy*, [IEEE Transactions on Artificial Intelligence \(2023\)](#)

[J19] Y. Huang*, S. Harilal, A. Bais, **A.E. Hussein**, *Progress Toward Machine Learning Methodologies for Laser-Induced Breakdown Spectroscopy With an Emphasis on Soil Analysis*, [IEEE Transactions on Plasma Science](#), **51**, 7 (2023)

[J18] **A.E. Hussein**, J.D. Ludwig, Y. Ma. P.-E. Masson-Laborde, P.J. Skrodzki, J. Hinojosa, E. Peter-

son, I. Jovanovic, A. Maksimchuk, J. Nees, A.G.R. Thomas, W. Rozmus, K. Krushelnick, *Direct spectral measurements of mid-infrared radiation from a laser wakefield accelerator*, [Physical Review A](#), **106** 063505 (2022)

[J17] M.J.V. Streeter, Y. Ma, B. Kettle, E. Gerstmayr, F. Albert, N. Bourgeois, S. Cipiccia, J.M. Cole, I.G. Gonzalez, A. Higginbotham, **A.E. Hussein**, K. Falk, K. Krushelnick, N. Lemos, N.C. Lopes, C. Lumsdon, S.P.D. Mangles, Z. Najmudin, P.P. Rajeev, M. Shahzad, M. Smid, R. Spesyvtsev, D.R. Symes, G. Vieux, A.G.R. Thomas, *Characterisation of Laser Wakefield Acceleration Efficiency with Octave Spanning Near-IR Spectrum Measurements*, [Physical Review Accelerators and Beams](#), **25** 101302 (2022)

[J16] N.F. Beier*, H. Allison, P. Efthimion, K. Flippo, L. Gao, S. Hansen, K. Hill, R. Hollinger, M. Logantha*, Y. Musthafa, R. Nedbailo, V. Senthilkumaran*, R. Shepherd, V.N. Shlyaptsev, H. Song, S. Wang, F. Dollar, J. Rocca, **A.E. Hussein**, *Homogeneous, micron-scale high-energy-density matter generated by relativistic laser-solid interactions*, [Physical Review Letters](#), **129** 135001 (2022)

[J15] V. Senthilkumaran*, K. Behm, D. Bailie, J. Warwick, G.M. Samarin, A. Maksimchuk, J. Nees, A. Thomas, G. Sarri, K. Krushelnick, **A.E. Hussein**, *Focused bremsstrahlung gamma rays driven by focused LWFA electron beam*, [Applied Physics Letters](#), **120** 264103 (2022)

[J14] A. Maitrallain, E. Brunetti, M. Streeter, B. Kettle, R. Spesyvtsev, G. Vieux, M. Shazhad, B. Ersfeld, S. Yoffe, A. Kornaszewski, O. Finlay, Y. Ma, F. Albert, N. Bourgeois, S. Dann, N. Lemos, S. Cipiccia, J. Cole, I. Gallardo González, A. Higginbotham, **A.E. Hussein**, M. Šmíd, K. Falk, K. Krushelnick, N. Lopes, E. Gerstmayr, C. Lumsdon, O. Lundh, S. Mangles, Z. Najmudin, P. Rajeev, D. Symes, A. Thomas, D. Jaroszynski, Dino *Parametric study of high-energy ring-shaped electron beams from a laser wakefield accelerator*, [New Journal of Physics](#), **24** 013017 (2022)

[J13] Y. Ma, D. Seipt, **A.E. Hussein**, S. Hakimi, N.F. Beier, S.B. Hansen, J. Hinojosa, A. Maksimchuk, J. Nees, K. Krushelnick, A.G.R. Thomas, F. Dollar, *The effects of laser polarization and wavelength on injection dynamics of a laser wakefield accelerator*, [Physics of Plasmas](#), **28** 6 (2021)

[J12] M. Stanfield, N. Beier*, S. Hakimi, H. Allison, D. Farinella, **A.E. Hussein**, T. Tajima and F. Dollar, *Relativistic few cycle laser pulses produced from self phase modulation in thin dielectric media*, [Optics Express](#), **29** 6 (2021)

[J11] **A.E. Hussein**, A.V. Arefiev, T. Batson, H. Chen, R.S. Craxton, A.S. Davies, D.H. Froula, Z. Gong, D. Haberberger, Y. Ma, P.M. Nilson, W. Theobald, T. Wang, K. Weichman, G.J. Williams, L. Willingale, *Towards the optimization of direct laser acceleration*, [New Journal of Physics](#), **23** 023031 (2021)

[J10] Y. Ma, D. Seipt, **A.E. Hussein**, S. Hakimi, N.F. Beier, S.B. Hansen, J. Hinojosa, A. Maksimchuk, J. Nees, K. Krushelnick, A.G.R. Thomas, F. Dollar, *Polarization-dependent self-injection by above threshold ionization heating in a laser wakefield accelerator*, [Physical Review Letters](#), **124**, 114801 (2020)

[J9] K. Behm, **A.E. Hussein**, T.Z. Zhao, R.A. Baggott, J.M. Cole, E. Hill, K. Krushelnick, A. Maksimchuk, J. Nees, S.J. Rose, A.G.R. Thomas, R. Watt, J.C. Wood, V. Yanovsky, S.P.D. Mangles, *Demonstration of Femtosecond Broadband X-rays from Laser Wakefield Acceleration as a Source for Pump-Probe X-ray Absorption Studies*, [High Energy Density Physics](#) **35**, 100729 (2020)

[J8] B. Kettle, E. Gerstmayr, M.J.V. Streeter, F. Albert, R.A. Baggott, J.M. Cole, S. Dann, K. Falk, I.G.

Gonzalez, **A.E. Hussein**, N. Lemos, N.C. Lopes, O. Lundh, Y. Ma, S.J. Rose, C. Spindloe, M. Smid, D.R. Symes, A.G.R. Thomas, R. Watt, S.P.D. Mangles, *Single shot multi-keV X-ray absorption spectroscopy using an ultrashort laser wakefield accelerator source*, [Physical Review Letters](#) **123**, 25 (2019)

[J7] P.T. Campbell, D. Canning, **A.E. Hussein**, K. Krushelnick, A.G.R. Thomas, L. Willingale, *Proton beam emittance growth due to surface plasma expansion and filamentation in kilojoule-class, multipicosecond laser-solid interactions*, [New Journal of Physics](#) **21**, 103021 (2019)

[J6] J. Li, P. Forestier-Colleoni, M. Bailly-Grandvaux, C. McGuffey, A.V. Arefiev, S.S. Bulanov, D.C. Gautier, J. Peebles, C. Krauland, **A.E. Hussein**, T. Batson, J.C. Fernandex, S. Palaniyappan, R.P. Johnson, G. Petrov, F.N. Beg, *Laser-driven acceleration of quasi-monoenergetic, near-collimated titanium ions via a transparency-enhanced acceleration scheme*, [New Journal of Physics](#) **21**, 103005 (2019)

[J5] **A.E. Hussein**, N. Senabulya, Y. Ma, M.J.V. Streeter, B. Kettle, S.J.D. Dann, F. Albert, N. Bourgeois, S. Cipiccia, J.M. Cole, O. Finlay, E. Gerstmayr, I. Gallardo González, A. Higginbotham, D.A. Jaroszynski, K. Falk, K. Krushelnick, N. Lemos, N.C. Lopes, C. Lumsdon, O. Lundh, S.P.D. Mangles, Z. Najmudin, P.P. Rajeev, C.M. Schlepütz, M. Shahzad, M. Smid, R. Spesytysev, D.R. Symes, G. Vieux, L. Willingale, J. C. Wood, A.J. Shahani and A.G.R. Thomas, *Laser-wakefield accelerators for high-resolution X-ray imaging of complex microstructures*, [Scientific Reports](#), **9**, 3249 (2019)

**Scientific Reports top 100 physics articles published in 2019, among top 25 most accessed*

[J4] K. Behm, **A. Hussein**, T.Z. Zhao, B. Hou, V. Yanovsky, J. Nees, A. Maksimchuk, W. Schumaker, K. Krushelnick, A.G.R. Thomas, *Measurements of electron beam ring structures from laser wakefield accelerators*, [Plasma Physics and Controlled Fusion](#) (2019)

[J3] D.M. Farinella, J. Wheeler, **A.E. Hussein**, J. Nees, M. Stanfield, N. Beier, G. Cojocar, G. Ungureanu, M. Pittman, J. Demailly, E. Baynard, R. Fabbri, R. Secareanu, M. Masruri, R. Dabu, A. Naziru, A. Maksimchuk, K. Krushelnick, G. Mourou, T. Tajima, F. Dollar, *Focusability of laser pulses at petawatt transport intensities in thin-film compression*, [Journal of the Optical Society of America B](#) **36**, 2 (2019)

[J2] **A.E. Hussein**, J. Ludwig, K. Behm, Y. Horovitz, P.-E. Masson-Laborde, C. Chvykov, A. Maksimchuk, T. Matsuoka, C. McGuffey, A.G.R. Thomas, W. Rozmus, V. Yanovsky, K. Krushelnick, *Stimulated Raman Backscatter from a laser wakefield accelerator*, [New Journal of Physics](#) **20** (2018)

[J1] **A.E. Hussein**, P. K. Diwakar, S.S. Harilal, A. Hassanein, *The effect of excitation laser wavelength on plasma generation and expansion of ablation plumes in air*, [Journal of Applied Physics](#) **113**, 143305 (2013)

CONFERENCE PROCEEDINGS

[C5] A.R. Arce-Borkent*, T. Richards, V. Senthilkumaran*, N.F. Beier*, L. Zhou, J.A. Moore, K.S. Knudsen, **A.E. Hussein**, M.G. Lipsett, *Design and Development of a Novel Tensile Testing Apparatus for Time-Resolved Betatron X-ray Tomographic Imaging*, Proceedings of the Canadian Society for Mechanical Engineering International Congress 2022

[C4] E. Saive*, L. Droog*, K. Ball, J. Swanson, E. Chao, M.G. Lipsett, **A.E. Hussein**, C.F. Lange, B.F. Cockburn, D.G. Elliott, *Design of an imaging payload for earth observation from a nanosatellite* [Small Satellite Conference SSC21-WKIV-05](#) (2021)

[C3] M. Stanfield, H. Allison, N. F. Beier*, S. Hakimi, **A.E. Hussein**, F. Dollar, *Generating relativistic intensities via staged pulse compression in dielectric media*, [OSA High-brightness Sources and Light-driven Interactions Congress 2020 \(EUVXRAY, HILAS, MICS\) JM3A.2 \(2020\)](#)

[C2] M. Stanfield, N. Beier*, S. Hakimi, **A.E. Hussein**, F. Dollar, *Few cycle EUV continuum generation via thin film compression*, [Conference on Lasers and Electro-Optics \(2020\)](#)

[C1] R. Spesytysev, E. Brunetti, G. Vieux, M. Shahzad, A. Maitrallain, S. Yoffe, B. Ersfeld, A. Kornaszewski, M. J. V. Streeter, O. Finlay, Y. Ma; B. Kettle, S. J. D. Dann, F. Albert, N. Bourgeois, S. Cipiccia, J. M. Cole, E. Gerstmayr, I. G. Gonzales, A. Higginbotham, **A. E. Hussein**, K. Falk, K. Krushelnick, N. Lemos, N. C. Lopes, C. Lumsdon, O. Lundh, S. P. D. Mangles, Z. Najmudin, P. P. Rajeev, M. Smid, D. R. Symes, A. G. R. Thomas, D. A. Jaroszynski, *Generation of electron high energy beams with a ring-like structure by a dual stage laser wakefield accelerator*, [Proceedings of SPIE **11036**, 110360F-1 \(2019\)](#)

STUDENT & POSTDOC SUPERVISION

Total supervised and co-supervised trainees: 30 (1 PDF, 4 PhDs, 7 MScs, 18 UGs)

Postdoctoral fellows:

1. Dr. Nicholas Beier, PhD in Physics, UC Irvine 2021 (2021-Present)

Doctoral students:

1. Vigneshvar Senthilkumaran (PhD, Photonics and Plasmas 2024 *expected*)
2. Yingchao Huang (Co-Supervised with Prof. Abdul Bais PhD, Electronic Systems Engineering, University of Regina, 2024 *expected*)
3. Shubho Mohajan (PhD, Photonics and Plasmas 2025 *expected*)
4. Yusuf Ojonoka (PhD, Photonics and Plasmas 2028 *expected*)

Master's students:

1. Liam Droog ((MSc, Photonics and Plasmas, 2025 *expected*)
2. Sakila Ansari (MSc, Photonics and Plasmas, 2025 *expected*)
3. Mariam Moussilli (MSc, Photonics and Plasmas, 2024 *expected*)
4. Carlton Kim (Co-Supervised with Prof. Richard Sydora, MSc, Physics, 2023 *expected*)
5. Aran McDowell (Co-Supervised with Prof. Frank Hegmann, MSc, Physics, 2022)
6. Madhu Beniwal (Co-Supervised with Prof. Amartya Sengupta, MTech, Physics, IIT Delhi, 2022)
7. Mohammad Kabir (MSc, Photonics and Plasmas supervised in 2021)

Undergraduate Students:

1. Ester Kriz (NSERC USRA Summer 2023, B.Sc. Physics Honours, McGill University, 2023)
2. Jason Song, (Summer Undergraduate Researcher, B.Sc. Electrical Engineering 2027 *expected*)
3. Carter Wassil (Dean's Research Award student 2023, B.Sc. Electrical Engineering 2025 *expected*)
4. Urian Martinkus (Dean's Research Award student 2023, B.Sc. Electrical Engineering 2024 *expected*)

5. Raghav Sharma (Dean's Research Award student 2023, B.Sc. Electrical Engineering 2024 *expected*)
6. Damien Hang (Dean's Research Award student 2022, B.Sc. Electrical Engineering 2024 *expected*)
7. Owen Cooke (Engineering Co-op intern 2022, Co-supervised with Dr. Rafiq Ahmad)
8. Bassam Nima (NSERC USRA, 2022, B.Sc. Engineering Physics 2023 *expected*)
9. Sadee Lamothe (I-STEAM Environmental Research Internships for Indigenous Students and NSERC USRA 2022, B.Sc. Physics 2022)
10. Ying Wan (Dean's Research Award student 2021/22, Co-op intern and NSERC USRA 2022, B.Sc. Co-op, Computer Engineering 2025 *expected*)
11. Benaka Achar (Dean's Research Award student 2022, B.Sc. Electrical and Computer Engineering 2025 *expected*)
12. Nehal Sekhon (Dean's Research Award student 2021/22, B.Sc. Co-op, Computer Engineering, 2025 *expected*)
13. Jamin Achtymichuk (Summer Undergraduate Researcher, Co-Supervised with Prof. Miles Dyck, B.Sc. Physics Honours 2021)
14. Liam Droog (NSERC USRA Summer 2021, B.Sc. Physics 2023 *expected*)
15. Fatima Keserwan (NSERC USRA Summer 2021, Co-Supervised with Prof. Mohamed Gamal El-Din, B.Sc. Civil & Environmental Engineering 2023 *expected*)
16. Max Stratmann Meouchi (Summer 2021, B.Sc. Engineering Physics 2022 *expected*)
17. Alvaro Arce-Borkent (Winter 2021 Co-Op, B.Sc. Mechanical Engineering 2022 *expected*)
18. Mahek Logantha (Summer Undergraduate Researcher, B.Sc. Mechanical Engineering, UCI, 2020)

Capstone Projects

Winter 2021/22: UofA Electrical Engineering Capstone Design Project:

Technical advisor for 2 groups of 4 senior undergraduate students (8 students in total) on the development of an auto-focussing system for intense laser pulses.

SELECTED SERVICE

PROFESSIONAL

Journal reviewer: Physical Review Letters, Physics of Plasmas, Plasma Physics and Controlled Fusion, Nuclear Fusion, Journal of the Optical Sciences of America B, European Journal of Medical Physics, Nuclear Instruments and Methods A, Applied Radiation and Isotopes, High Power Laser Science and Engineering

Proposal Reviewer

- [US Department of Energy \(DOE\)](#), Office of Science 2021, 2023
- [US National Science Foundation \(NSF\) Science and Technology Centers](#), Site Visit 2020
- [US NSF/DOE Partnership in Basic Plasma Science and Engineering](#) 2020

Guest Editor:

[Journal of Plasma Physics Special Issue on Laser and Plasma Accelerators](#)

09/2023 - Present

Board of Directors: Fusion Energy Council of Canada	10/2022 - Present
Editorial Advisory Board: Matter and Radiation at Extremes	01/2023 - Present
Strategic Planning Committee: Advanced Laser Light Source	9/2021 - Present
Co-Chair: US Department of Energy, Intense-light USers Engagement (I-USE)	3/2021 - Present
Co-Director of Outreach/Equity, Diversity and Inclusion, UofA Engineering	1/2021 - Present
Executive Committee: Jupiter Laser Facility User Group	1/2021 - Present
Webmaster: Canadian Association of Physicists, Division of Plasma Science	4/2021 - Present
Postdoctoral representative: UCI Committee on Inclusive Excellence	02/2020 - 06/2020

ACADEMIC & RESEARCH

Mentor: The Indigenous and Black Engineering Technology PhD Project	05/2021 - Present
Curriculum Committee : UAlberta Energy Systems Signature Area	04/2021 - Present
Co-Founder: UAlberta Climate Hack Student Engagement	2/2021 - Present
Faculty Advisor: AlbertaSat	09/2020 - Present

CONFERENCES

Technical Program Committee: CLEO Conference	6/2022 - Present
Moderator: 2023 Alberta Innovates Inventure\$, Soil Carbon Quantification and Credits Panel	06/2023
Program Committee: 2023 Laser Plasma Accelerators Workshop	9/2022 - 03/2023
Program Committee: 2022 APS Division of Plasma Physics Meeting	2/2022 - 10/2022
Chair: 2022 IEEE ICOPS , Women in Engineering Reception	8/2021 - 05/2022
Session chair: 2021 OSA Frontiers in Optics + Laser Science Annual Meeting	11/2021
Session chair: 2019 APS Division of Plasma Physics Meeting	10/2019

OUTREACH

Board member: The Tomorrow Foundation for a Sustainable Future	09/2023 - Present
Board member: Women in Scholarship, Engineering, Science, and Technology	07/2023 - Present
Committee member: APS Women+ in Plasma Physics	1/2021 - Present

Co-organizer: UAlberta Exploring Energy Systems Webinar Series, Sessions 1,4	11/2021
Invited panelist: UAlberta Climate Change Action Theatre	11/2021
Volunteer: UAlberta WISEST SET Conference	2020/21
Evaluation committee: UAlberta William Muir Edwards Citizenship Award	2021

TEACHING EXPERIENCE

Course professor: UAlberta ECE 202: Electrical Circuits I 117 students	Fall 2023
Technical advisor: UAlberta ECE 490/491: Electrical Engineering Capstone Design	2021/2022
Course professor: UAlberta ECE 202: Electrical Circuits I 52 students, student ratings of instructor effectiveness 5.0/5.0.	Fall 2021
Lecturer: PPPL Introduction to Fusion Energy and Plasma Physics Course	June 2021
Course professor: UAlberta ECE 209: Fundamentals of Electrical Engineering 136 students, student ratings of instructor effectiveness 4.8/5.0.	Winter 2021
Course assistant: Michigan Math and Science Scholars	06/2019
Volunteer lecturer: Code.org	11/2016 - 07/2019
Volunteer tutor: Washtenaw Literacy	11/2016 - 07/2019

MEMBERSHIPS

The Institute of Electrical and Electronics Engineers (IEEE)	Since 2013
American Association of Physicists	Since 2013
The International Society for Optics and Photonics (SPIE)	Since 2013
Canadian Association of Physicists	Since 2013
Optical Society of America	Since 2020

SKILLS AND COMPETENCIES

Languages: English (native), French (professional)

Laboratory experience: Experience leading and collaborating with international teams of scientists on high-intensity laser plasma experiments performed at the following facilities:

- HERCULES laser, University of Michigan, USA
- OMEGA EP laser, Laboratory for Laser Energetics, University of Rochester, USA

- Gemini laser, Rutherford Appleton Laboratory, UK
- Trident laser, formerly at Los Alamos National Laboratory, USA
- ELFIE laser, Laboratoire pour l'Utilisation des Laser Intenses, France
- ALEPH laser, Colorado State University, USA
- Advanced Laser Light Source, Institut national de la recherche scientifique, Canada

Programming: Shell-script, MATLAB, Fortran, Python, Julia

Software: EPOCH, VisIt, AutoCAD, TRIM/SRIM, ImageJ, VisRad

PRESENTATIONS

INVITED TALKS & SEMINARS

- [25] High-resolution tomography of porosity evolution in additively manufactured alloys using betatron x-rays, Advanced Laser Light Source Workshop, St Sauveur, Canada, September 5-8, 2023
- [24] High-resolution tomography of porosity evolution in additively manufactured alloys using betatron x-rays, US Department of Energy LaserNetUS Annual Meeting, College Park, USA, June 27-29, 2023
- [23] Laser-induced breakdown spectroscopy for analysis of complex environmental samples, Photonics North Conference 2023, Montreal, Canada, June 12-15, 2023
- [22] Micron-scale high energy density matter generated by relativistic laser-solid interactions, International Conference on High Energy Density Science 2023, Yokohama, Japan, April 18-21, 2023
- [21] Laser-driven X-rays for characterization of advanced materials, International Conference on Extreme Light (ICEL 2022), Prague, Czech Republic, November 2-4, 2022
- [20] Multi-modal radiation sources from laser-driven electron accelerators, Frontiers in Optics + Laser Science, Rochester, USA, October 16-20, 2022
- [19] Laser induced breakdown spectroscopy (LIBS) for in-situ soil analysis, Optica Optical Sensors and Sensing Congress, Vancouver, BC, July 11-15, 2022
- [18] Caractérisation des matériaux en utilisant de sources de rayons X générés par laser, 89e Congrès de l'Acfas, Virtual, May 9-10, 2022
- [17] Characterization of advanced materials using laser-driven x-ray sources, University of Texas at Austin Plasma Physics Seminar, Virtual, March 8, 2022
- [16] Laser-plasma interactions in the relativistic regime, IEEE Nanotechnology Young Professionals World Marathon, Virtual, November 24, 2021
- [15] Multi-millijoule infrared pulses from a laser wakefield accelerator, Optical Society of America (OSA) Frontiers in Optics and Laser Science meeting, Virtual, October 31 - November 4 2021

- [14] Laser wakefield accelerators as a broadband radiation source, European Optical Society Annual Meeting, Virtual, September 13-17 2021
- [13] X-ray production using relativistically intense laser pulses, Canadian Association of Physicists, Division of Plasma Physics Symposium, Virtual, June 6-11 2021
- [12] Laser-wakefield accelerators for high-resolution X-ray imaging of complex microstructures, International High Power Laser Ablation Conference, Virtual, April 12-15 2021
- [11] Laser-wakefield accelerators for high-resolution, time-resolved probing of complex matter, 2020 Sino-Canadian Bilateral Workshop, Remote, November 25-27 2020
- [10] Optimizing Direct Laser Acceleration, The 61st Annual Meeting of the APS Division of Plasma Physics, Fort Lauderdale, FL, USA, October 21-25 2019
- [9] Optimizing Direct Laser Acceleration, The 46th European Physical Society Conference on Plasma Physics, Milan, Italy, July 8th - 12th 2019
- [8] New frontiers in laser-plasma interactions: from fundamental physics to high-resolution diagnostics, UC Irvine Plasma Physics Special Seminar, June 20, 2019
- [7] Laser wakefield accelerators as a broadband radiation source - from infrared to X-rays, University of Alberta Department of Electrical and Computer Engineering Research Seminar, Alberta, Canada, April 29th, 2019
- [6] Exploring electron and radiation production using femtosecond and picosecond laser pulses, UC Irvine Plasma Physics Seminar Series, February 19, 2019
- [5] Exploring electron and radiation production using femtosecond and picosecond laser pulses, University of Rochester Laboratory for Laser Energetics Research Seminar, Rochester, NY, USA, September 24, 2018
- [4] The role of plasma density in the generation of high energy, low divergence electron beams, US-Japan Workshop Theory and Simulations of High-Field and High Energy Density Physics, Hiroshima, Japan, March 2018
- [3] Influence of plasma density on the generation of 100s MeV electrons via Direct Laser Acceleration, US-Japan Workshop on Laser-Plasma Interactions and High Energy Density Physics, General Atomics, San Diego, CA, December 2017
- [2] The role of hot electrons in the creation of hollow atoms by relativistic laser-plasma interaction, Lawrence Berkeley National Lab, Berkeley Lab Laser Accelerator Center, Berkeley, CA, USA, April 2016
- [1] Experimental and computational analysis of ultra-short laser-matter interactions, Argonne National Lab, Advanced Photon Source, Time Resolved Research Group, Lemont, IL, USA, March 2015

CONTRIBUTED TALKS & POSTERS

As presenter only

[34] **Talk:** A.E. Hussein, V. Senthilkumaran, N. Beier, S. Fourmaux, T. Richards, A. Arce-Borkent, S. Meschian, S. Knudsen, M. Lipsett, P. Shabaninezhad, J. Stinehart, L. Zhou, J.A. Moore, Imaging of dynamic processes in materials using high-repetition rate betatron X-rays, Laser and Plasma Accelerators Workshop 2023, Lagos, Portugal, March 6-10, 2023

[33] **Talk:** A.E. Hussein, *The role of hot electrons in the generation of anomalous X-ray spectra from ultra-intense laser-plasma interactions*, 62th Annual Meeting of the APS Division of Plasma Physics, Remote, November 2020

[32] **Flash talk:** A.E. Hussein, *Applications of plasma-based betatron radiation*, American Physical Society Division of Particles and Fields Particle Physics Community Planning Exercise (Snowmass), October 2020

[31] **Poster:** A.E. Hussein, A.V. Arefiev, F. Dollar, Z. Gong, Y. Ma, T. Wang, K. Weichman, L. Willingale, *The effect of pulse duration on the generation of high-charge, high-average energy electron beams via Direct Laser Acceleration*, NIF and JLF User Group Meeting, Lawrence Livermore National Lab, CA, USA, February 2020

[30] **Poster:** A.E. Hussein, J. Ludwig, W. Rozmus, Y. Ma, P-E. Masson-Laborde, J. Nees, A. Maksimchuk, J. Hinojosa, E. Peterson, A. Thomas, K. Krushelnick, *Measurements of mid-infrared radiation from a laser wakefield accelerator*, 61th Annual Meeting of the APS Division of Plasma Physics, Fort Lauderdale, FL, USA, October 2019

[29] **Talk:** A.E. Hussein, N. Senabulya, Y. Ma, M.J.V. Streeter, B. Kettle, S.J.D. Dann, J.M. Cole, F. Albert, N. Bourgeois, S. Cipiccia, O. Finlay, E. Gerstmayr, I. Gallardo González, A. Higginbotham, D.A. Jaroszynski, K. Falk, K. Krushelnick, N. Lemos, N.C. Lopes, C. Lumsden, O. Lundh, S.P.D. Mangles, Z. Najmudin, P.P. Rajeev, M. Shahzad, M. Smid, R. Spesytysev, M.J.V. Streeter, D.R. Symes, G. Vieux, J. C. Wood, A.J. Shahani and A.G.R. Thomas, *Laser-wakefield accelerators for high-resolution X-ray imaging of complex microstructures*, 4th European Advanced Accelerator Concepts Workshop, Isola d'Elba, Italy, September 2019

[28] **Poster:** A.E. Hussein, N. Senabulya, Y. Ma, M.J.V. Streeter, B. Kettle, S.J.D. Dann, J.M. Cole, F. Albert, N. Bourgeois, S. Cipiccia, O. Finlay, E. Gerstmayr, I. Gallardo González, A. Higginbotham, D.A. Jaroszynski, K. Falk, K. Krushelnick, N. Lemos, N.C. Lopes, C. Lumsden, O. Lundh, S.P.D. Mangles, Z. Najmudin, P.P. Rajeev, M. Shahzad, M. Smid, R. Spesytysev, M.J.V. Streeter, D.R. Symes, G. Vieux, J. C. Wood, A.J. Shahani and A.G.R. Thomas, *Laser-wakefield accelerators for high-resolution X-ray imaging of complex microstructures*, Michigan Institute of Plasma Sciences and Engineering, Ann Arbor, MI, USA, November 2018

**Best Poster Award*

[27] **Talk:** A.E. Hussein, Y. Ma, J. Hinojosa, J. Nees, A. Maksimchuk, A.G.R. Thomas, K. Krushelnick, *Spectral measurements of mid-infrared radiation from a laser wakefield accelerator*, 60th Annual Meeting of the APS Division of Plasma Physics, Portland, OR, USA, November 2018

[26] **Poster:** A.E. Hussein, N. Senabulya, Y. Ma, M.J.V. Streeter, B. Kettle, S.J.D. Dann, J.M. Cole, F. Albert, N. Bourgeois, S. Cipiccia, O. Finlay, E. Gerstmayr, I.G. González, A. Higginbotham, D.A. Jaroszynski, K. Falk, K. Krushelnick, N. Lemos, N.C. Lopes, C. Lumsden, O. Lundh, S.P.D. Mangles, Z. Najmudin, P.P. Rajeev, M. Shahzad, M. Smid, R. Spesytysev, M.J.V. Streeter, D.R. Symes, G. Vieux, J. C. Wood,

A.J. Shahani and A.G.R. Thomas, *Laser-wakefield accelerators for high-resolution X-ray imaging of complex microstructures*, University of Michigan Engineering Graduate Symposium, Ann Arbor, MI, USA, October 2018

**Peer reviewed*

[25] **Poster: A.E. Hussein**, A.V. Arefiev, T. Batson, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, T. Wang, K. Weichman, G.J. Williams L. Willingale, *The role of quasi-static channel fields in Direct Laser Acceleration of electron beams to 0.6 GeV*, Laser Megajoule - Petal User Meeting, Bordeaux, France, October 2018

[24] **Poster: A.E. Hussein**, J. Ludwig, K. Behm, Y. Horovitz, C. Chvykov, A. Maksimchuk, T. Matsuoka, P.-E. Masson-Laborde, C. McGuffey, W. Rozmus, V. Yanovsky, K. Krushelnick, *Stimulated Raman Backscatter from a laser wakefield accelerator*, Conference of the International Committee on Ultrahigh Intensity Lasers, Lindau, Germany, September 2018

**Best Poster Award*

[23] **Poster: A.E. Hussein**, A.V. Arefiev, T. Batson, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, T. Wang, K. Weichman, G.J. Williams L. Willingale, *Direct Laser Acceleration of electron beams to 0.6 GeV using optimized plasma targets*, LaserNet USA Meeting, Lincoln, NE, August 2018

[22] **Talk: A.E. Hussein**, A.V. Arefiev, T. Batson, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, T. Wang, K. Weichman, G.J. Williams L. Willingale, *Direct Laser Acceleration of electron beams to 0.6 GeV using optimized plasma targets*, Advanced Accelerator Concepts Workshop, Breckenridge, CO, USA, August 2018

[21] **Poster: A.E. Hussein**, T. Batson, A.V. Arefiev, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, K. Weichman, G.J. Williams L. Willingale, *The role of quasi-static channel fields in Direct Laser Acceleration*, OMEGA Laser Facility Users Workshop, Lab for Laser Energetics, Rochester, NY, USA, April 2018

**Best Poster Award*

[20] **Poster: A.E. Hussein**, T. Batson, A.V. Arefiev, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, T. Wang, G.J. Williams L. Willingale, *Influence of plasma density on the generation of 100s MeV electrons via Direct Laser Acceleration*, Applied Physics 30th Anniversary Symposium, University of Michigan, Ann Arbor, MI, USA, December 2017

[19] **Talk: A.E. Hussein**, T. Batson, A.V. Arefiev, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, T. Wang, G.J. Williams L. Willingale, *Influence of plasma density on the generation of 100s MeV electrons via Direct Laser Acceleration*, 58th Annual Meeting of the APS Division of Plasma Physics, Milwaukee, WI, USA, October 2017

[18] **Poster: A.E. Hussein**, T. Batson, A.V. Arefiev, H. Chen, R.S. Craxton, A. Davies, D.H. Froula, D. Haberberger, O. Jansen, K. Krushelnick, P.M. Nilson, W. Theobald, T. Wang, G.J. Williams L. Willingale, *Influence of plasma density on the generation of 100s MeV electrons via Direct Laser Acceleration*, Michigan Institute for Plasma Science and Engineering, Ann Arbor, MI, USA, October 2017

- [17] **Talk: A.E. Hussein**, K. Behm, Y. Horovitz, C. Chvykov, J. Ludwig, A. Maksimchuk, T. Matsuoka, P.-E. Masson- Laborde, C. McGuffey, A.G.R. Thomas, W. Rozmus, V. Yanovsky, K. Krushelnick, *Stimulated Raman Backscatter from a laser wakefield accelerator*, IBS Conference on Laser Plasma Accelerators, Jeju Island, Korea, August 2017
- [16] **Poster: A.E. Hussein**, T. Batson, K. Krushelnick, A. Arefiev, T. Wang, P. Nilson, D. Froula, D. Haberberger, A. Davies, W. Theobald, J. Walson, H. Chen, L. Willingale, *PIC simulations of direct laser accelerated electrons from under-dense plasmas using the OMEGA EP Laser*, OMEGA Laser Facility Users Workshop, Lab for Laser Energetics, Rochester, NY, USA, April 2017
- [15] **Talk: A.E. Hussein**, T. Batson, K. Krushelnick, A. Arefiev, T. Wang, P. Nilson, D. Froula, D. Haberberger, A. Davies, W. Theobald, J. Walson, H. Chen, L. Willingale, *PIC simulations of direct laser accelerated electrons from under-dense plasmas using the OMEGA EP Laser*, US-Japan Workshop on High Energy Density Physics and Laser Plasma Interactions, San Jose, CA, USA, November 2016
- [14] **Poster: A.E. Hussein**, T. Batson, K. Krushelnick, A. Arefiev, T. Wang, P. Nilson, D. Froula, D. Haberberger, A. Davies, W. Theobald, J. Walson, H. Chen, L. Willingale, *PIC simulations of direct laser accelerated electrons from under-dense plasmas using the OMEGA EP Laser*, 57th Annual Meeting of the APS Division of Plasma Physics, San Jose, CA, USA, November 2016
- [13] **Poster: A.E. Hussein**, J. D. Hager, K. Krushelnick, J. L. Kline, B. C. Tappan, W. L. Boncher, F. Elsner, A. Nikroo, K. A. Flippo, *The role of hot electrons in the creation of hollow atoms by relativistic laser-plasma interaction*, NIF and JLF User Group Meeting, Lawrence Livermore National Lab, CA, USA, January 2017
- [12] **Poster: A.E. Hussein**, J. D. Hager, K. Krushelnick, J. L. Kline, B. C. Tappan, W. L. Boncher, F. Elsner, A. Nikroo, K. A. Flippo, *The role of hot electrons in the creation of hollow atoms by relativistic laser-plasma interaction*, Michigan Institute for Plasma Science and Engineering, Ann Arbor, MI, USA, October 2016
- [11] **Poster: A.E. Hussein**, K. Behm, J. Nees, A. Maksimchuk, S. Reed, V. Yanovsky, Y. Horovitz, K. Krushelnick, *Stimulated Raman Backscattering in laser wakefield accelerators*, Advanced Accelerator Concepts Workshop, National Harbor, MD, USA, August 2016
- [10] **Poster: A.E. Hussein**, J. D. Hager, K. Krushelnick, J. L. Kline, B. C. Tappan, W. L. Boncher, F. Elsner, A. Nikroo, K. A. Flippo, *Development of a cold k -alpha short-pulse backlighter source at relativistic laser intensities*, OMEGA Laser Users' Facility Workshop, University of Rochester, Laboratory for Laser Energetics, Rochester, NY, USA, April 2016
- *Best Poster Award*
- [9] **Poster: A.E. Hussein**, J. D. Hager, K. Krushelnick, J. L. Kline, B. C. Tappan, W. L. Boncher, F. Elsner, A. Nikroo, K. A. Flippo, *Development of a cold k -alpha short-pulse backlighter source at relativistic laser intensities*, American Physical Society Division of Plasma Physics Meeting, Savannah, GA, USA, November 2015
- [8] **Poster: A.E. Hussein**, L. Willingale, *Enhancement of relativistic electron heating in picosecond laser-driven accelerators for generation of high-energy photon beams*, High Energy Density Summer School, Uni-

versity of California San Diego, San Diego, CA, USA, August 2015

[7] **Talk: A.E. Hussein**, V. Morozov, *Evaluation and enhancement of the SKOPE source-to-source compiler*, Argonne Leadership Computing Facility, Lemont, IL, USA, August 2015

[6] **Poster: A.E. Hussein**, S. S. Harilal, A. Hassanein, *Relativistic self-focusing in under-dense plasma and applications for proton beam generation*, OMEGA Laser Users' Facility Workshop, University of Rochester, Laboratory for Laser Energetics, Rochester, NY, USA, April 2014

[5] **Poster: A.E. Hussein**, P. K. Diwakar, S. S. Harilal, A. Hassanein, *Effects of excitation wavelength on laser ablation and laser-induced plasma formation*, Conference for Undergraduate Women in Physics, California Institute of Technology, Pasadena, CA, USA, January 2013

**Best Poster Award*

[4] **Talk: A.E. Hussein**, P. K. Diwakar, S. S. Harilal, A. Hassanein, *Effects of excitation wavelength on laser ablation and laser-induced plasma formation*, Canadian Undergraduate Physics Conference, University of British Columbia, Vancouver, BC, Canada, November 2012

**Best Talk Award*

[3] **Poster: A.E. Hussein**, P. K. Diwakar, S. S. Harilal, A. Hassanein, *Effects of excitation wavelength on laser ablation and laser-induced plasma formation*, University Faculty of Science Undergraduate Research Conference, McGill University, Montréal, QC, Canada, October 2012

[2] **Poster: A.E. Hussein**, P. K. Diwakar, S. S. Harilal, A. Hassanein, *Effects of excitation wavelength on laser ablation and laser-induced plasma formation*, McGill University Department of Physics Undergraduate Research Conference, Montréal, QC, Canada, September 2012

**Best Poster Award*

[1] **Poster: A.E. Hussein**, P. K. Diwakar, S. S. Harilal, A. Hassanein, *Effects of excitation wavelength on laser ablation and laser-induced plasma formation*, Federation of Analytical Chemists and Spectroscopy Societies for Scientific Exchange Conference, Kansas City, MO, September 2012