

Contact info: Mustapha Ishak-Boushaki, Professor of Physics and Astrophysics
 Department of Physics, University of Texas at Dallas, EC36
 800 West Campbell Road, Richardson, TX, 75080.
 Email: mishak@utdallas.edu. Phone: 972-883-2815



Educational History:

Ph.D. in Cosmology and General Relativity (2003), Queen's University at Kingston, Canada
 B. Sc. in Physics (1998), University of Montreal, Canada
 B. A.Sc. in Computer Sciences (1994), University of Quebec at Montreal, Canada
 Research Associate, 01-01-2003 to 07-31-2005, Princeton University, New Jersey, USA

Employment History:

Professor	09-01-2015 - Present	University Of Texas at Dallas
Associate Professor	09-01-2011 to 08-31-2015,	University Of Texas at Dallas
Assistant Professor	08-01-2005 to 08-31-2011	University Of Texas at Dallas
Research Associate,	01-01-2003 to 07-31-2005,	Princeton University, New Jersey
Lecturer,	Fall 2003 and Spring 2004,	Princeton University, New Jersey
Research Assistant,	07-01-1998 to 12-31-2002,	Queen's University, Kingston, Canada
Teaching assistant	07-01-1998 to 12-31-2002,	Queen's University, Kingston, Canada

Professional recognitions, honors and awards:

- 2018 *Award for Outstanding Teacher of the Year* from the School of Natural Sciences and Mathematics, University of Texas at Dallas
- 2013 *Robert S. Hyer Award* for Excellence in Research from the Texas Section of the American Physics Society. Jointly with graduate student Michael Troxel.
- 2013 Journal paper highlighted at Physical Review Letters as Editors' suggestion and selected for a synopsis in *Spotlighting Exceptional Research in Physics* website of the American Physical Society. Article: "Stringent Restriction from the Growth of Large-Scale Structure on Apparent Acceleration in Inhomogeneous Cosmological Models", Mustapha Ishak, Austin Peel, and M. A. Troxel. *Phys. Rev. Lett.* 111, 251302 (2013).
- 2008 Journal paper selected by Chief Editor Gerardus 't Hooft (Nobel Laureate in Physics 1999) to appear in the highlights of 2008 of the *Foundation of Physics Journal*. Article: "Remarks on the formulation of the cosmological constant/dark energy questions. Mustapha Ishak. *Foundation of Physics Journal*, 37:1470-1498 (2007).
- 2007 *Award for Outstanding Teacher of the Year* from the School of Natural Sciences and Mathematics, University of Texas at Dallas

2002-2004 Postdoctoral Fellowship for Excellence in Research and Leadership from the Natural Sciences and Engineering Research Council of Canada (NSERC).

2002 Journal Paper voted by the Editorial Board of Classical and Quantum Gravity Journal as one of the journal's highlights of 2002. Article title: Interactive Geometric Database, Including Exact Solutions of Einstein's Field Equations, Mustapha Ishak and Kayll Lake, Classical and Quantum Gravity 19, 505-514 (2002).

Research interests:

- The origin/cause of the acceleration of the expansion of the Universe: Cosmological Constant, Dark Energy, Extensions to General Relativity.
- Testing Dark Energy versus Modified Gravity at Cosmological Scales.
- Gravitational Lensing and applications to cosmology
- Constraining cosmological parameters and cosmological models using probes such as gravitational lensing, the cosmic microwave background (CMB), and supernova searches.
- Inhomogeneous Cosmological Models
- Selected topics in General Relativity and Cosmological Exact Solutions to Einstein's Equations
- Projects at the intersection of modern cosmology and General Relativity
- Junction conditions for matching spacetimes and constructing wormholes and thin-shells
- Computer Algebra (symbolic computing) and application to cosmology and general relativity

Research funding and grants:

- PI, Department of Energy, 2018-2021 (Project in Cosmology and Dark Energy)
- PI, National Science Foundation, 2015-2018 (Project in Astrophysics and Gravitational Lensing)
- PI, The John Templeton Foundation, 2014-2017 (Project in Cosmology).
- PI, National Science Foundation, AAG program, 2011-2014 (Project in Astrophysics and Gravitational Lensing)
- PI, Department of Energy, Theory, 2010-2013 (Project in Cosmology and Dark Energy)
- PI, NASA Astrophysics Theory Program, 2009-2013 (Project in Cosmology and Cosmic Acceleration)
- PI, Texas Space Grant Consortium, 2008 (Research Project in Astrophysics and Cosmic Acceleration)
- PI, From Corporate Sector, 2008 (Research Project I in Gravity & statistics)
- PI, From Corporate Sector, 2009 (Research Project II in Gravity & statistics)
- PI, Hoblitzelle foundation, 2006 (Grant to build a Computer Cluster).

Professional memberships:

- Member of the American Physical Society
- Member of the American Astronomy Society
- Member of Sigma Xi, the Scientific Research Society
- Full Member of the Large Synoptic Survey Telescope (LSST): Dark Energy Science Collaboration (DESC).

Student supervision and mentoring at UT-Dallas:**Graduated Ph.D. Students:**

1. James Richardson (graduated in May 2008). Working in the corporate sector
2. Jacob Moldenhaeur (graduated in May 2010). Assistant Professor, University of Dallas, TX.
3. Anthony Nwankwo (graduated in May 2011). Working in the corporate sector.
4. Jason Dossett (graduated in May 2013). Research Associate in Astrophysics and Cosmology at the National Institute for Astrophysics (INAF), Brera, Italy.
5. Michael Troxel (graduated in May 2014). Research Associate in Astrophysics and Cosmology at Ohio State University.
6. Austin Peel (graduated in May 2015). Research Associate in Astrophysics and Cosmology at the Institute of Astrophysics, CEA-Saclay, France.
7. Tharake Wijenayake (graduated in May 2016). Working in the corporate sector.
8. Ji Yao (graduated in April 2018). Accepted Research Associate position at Shanghai Jiao Tong University, China (starting in September 2018).
9. Weikang Lin (graduation in August 2018). Accepted Research Associate position at the University of North Carolina (starting in August 2018).

Current Ph.D. students:

1. Rahul Kumar Solanki (graduation expected in 2020).
2. Eske Pederson (graduation expected in 2021).
3. Anish Agashe (graduation expected in 2022).
4. Logan Fox (graduation expected in 2023).

Masters' students supervised:

1. Chris Allison,
2. Jeffrey Scott,
3. John Thompson,
4. Delilah Whittington,
5. Brian Troup,
6. Lee Caps

Undergraduate student supervised:

1. Katherine Morgan (undergraduate Thesis/research, 2006)
2. Lee Isaac Trawick, (undergraduate Thesis/research, 2006)
3. Sriram Nagaraj, (undergraduate Thesis/research, 2006)
4. Wendy Gartenberg, (undergraduate Thesis/research, 2007)
5. John Wilson (undergraduate Thesis/research, 2007)
6. Austin Peel (undergraduate Thesis/research, 2007)
7. Jason Dossett, (undergraduate Thesis/research, 2007 and 2008)
8. Tan Lee, (undergraduate Thesis/research, 2008)
9. John Thompson (Undergraduate Thesis/Research, 2008)
10. Lee Caps (undergraduate Thesis/research, 2009)
11. Thomas Griffins (Undergraduate Research Project, 2012)
12. Nathan Newton (Undergraduate Research Project, 2012)
13. Jonathan Woodbury (undergraduate Thesis/research, 2013)
14. Victor Lee (Undergraduate Research Project, 2015)
15. Joseph Burnet (undergraduate Thesis/research, 2015)
16. Cristhian Quintero (undergraduate research, 2016)
17. Logan Fox (undergraduate research, Spring and Fall 2017)
18. Lindsey Rayborn (undergraduate research, Spring and Fall 2016)

High-school students summer internships:

1. Tim Carlton summer 2006
2. Ray Whitside, summer 2007
3. Sid Mittal, summer 2008
4. Parker Maginley, summer 2008
5. Brandyn Lee, summer 2009
6. Scott Meesse, summer 2009
7. Genway Huang, summer 2010
8. Evan Remmele, summer 2011

Participation as member in the Ph.D. dissertation committee of :

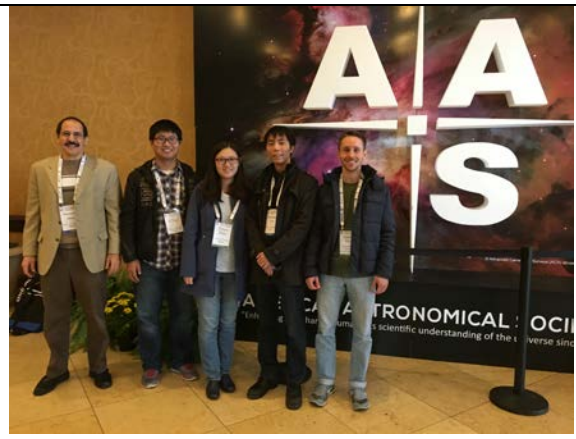
1. Wei-Cheng Wong, Physics department. Degree awarded 2010.
2. Christina Torres, Physics Department. Degree awarded 2008.
3. Harisankar Namasivayam, Physics Department, Degree awarded 2015.
4. Mathew Titsworth, Physics and Math Departments. Degree awarded 2016
5. Susmita Jyotishmati, Physics Department. Degree awarded 2017
6. Robert Buckley, Physics Department, UT San Antonio. Degree awarded 2015.
7. Joseph Coleman, Ph.D. candidate, Physics Department.
8. Brandyn Lee, Ph.D. candidate, Physics Department.
9. Peter Niedbalski, Ph.D. candidate, Physics Department
10. Joseph Coleman, Ph.D. candidate, Physics Department.
11. Miyoung Choi, Ph.D. candidate, Physics Department.
12. Matthew Fong, Ph.D. candidate, Physics Department.
13. Xinyu Zhang, Ph.D. candidate, Physics Department.
14. Juan Servin, Ph.D. candidate, Physics Department.

The Cosmology, Relativity, and Astrophysics group at UT Dallas

Ishak-Boushaki started an active research group in cosmology at UT-Dallas in 2005 that has grown since to 5 faculty members and ~15 students. He established funding with federal agencies (NASA, National Science Foundation and Department of Energy). He also secured funding from the corporate sector and private foundations.



Ishak and graduate students Jason Dossett, Austin Peel and Michael Troxel at the 219th AAS Annual Meeting — Austin, TX, 2012



Ishak, graduate students Ji Yao, Xinyu Zhang, Weikang Lin, and researcher Austin Peel from Saclay. AAS meeting in Grapevine, TX, 2017

Teaching experience:The University of Texas at Dallas

Spring 2018 PHYS5392 Relativity II - General Relativity
 Fall 2017 PHYS2325 Mechanics
 Fall 2016 PHYS5311 Graduate Classical Mechanics
 Spring 2016 PHYS5393 Relativity II – Special Relativity
 Fall 2015 PHYS5311 Graduate Classical Mechanics
 Spring 2015 PHYS5349 Cosmology
 Fall 2014 PHYS5311 Graduate Classical Mechanics
 Spring 2014 PHYS5392 Relativity II – General Relativity
 Fall 2013 PHYS5311 Graduate Classical Mechanics
 Spring 2013 PHYS3312 Classical Mechanics
 Fall 2012 PHYS2325 Mechanics
 Spring 2012 PHYS2325 Mathematical Methods for Physics III
 Fall 2011 PHYS3312 Classical Mechanics
 Spring 2011 PHYS2325 Mechanics
 Fall 2010 PHYS2325 Mechanics;
 PHYS3312 Classical Mechanics
 Spring 2010 PHYS2325 Mechanics;
 PHYS5349 Cosmology
 Fall 2009 PHYS2325 Mechanics;
 PHYS3312 Classical Mechanics
 Spring 2009 PHYS2325-001 Mechanics;
 PHYS2325-002 Mechanics;
 Fall 2008 PHYS2325 Mechanics;
 PHYS2325 Classical Mechanics
 Spring 2008 PHYS2325 Mechanics;
 PHYS2325 Mechanics
 Fall 2007 PHYS3312 Classical Mechanics;
 PHYS5349 Cosmology
 Spring 2007 PHYS2325 Mechanics and Heat;
 PHYS2325 Mechanics and Heat
 Fall 2006 PHYS2325 Mechanics and Heat;
 PHYS3312 Classical Mechanics
 Spring 2006 PHYS2325 Mechanics and heat;
 PHYS5V49 Cosmology
 Fall 2005 PHYS2325 Mechanics and Heat,

Princeton University

Spring 2004 Preceptor for AST203 (lecturer appointment): The Universe
 Fall 2003 Preceptor for PHYS103 (lecturer appointment): General Physics

Queen's University, Kingston, Ontario, Canada

1998-2001 Teaching assistant and laboratory demonstrator for several physics courses including: PHY106, PHY107, PHY113, PHY414

University of Quebec in Montreal, Canada

1990-1992 Teaching assistant and demonstrator for several computer science courses including: INF1000, INF1090, INF3200, INF4200

National and International Service contributions:

- Chairman of the International Scientific Organizing Committee for the Texas Symposium on Relativistic Astrophysics (2013-2015)
- Served as proposal reviewer for the National Science Foundation, Astronomy and Astrophysics Grant program
- Served as proposal reviewer for the International Collaboration Program of the National Science Foundation
- Served as proposal reviewer for NASA Astronomy and Astrophysics Postdoctoral Program.
- Served as proposal reviewer for Research Foundation of Canada/Quebec for Natural Sciences and Technology.
- Served as proposal reviewer for the National Commission for Scientific and Technological Research of Chile (CONICYT Chile).
- Reviewed a proposal for The Foundation for Polish Science.
- Served as proposal reviewer for the Texas Space Grant Consortium
- Served on the Editorial Board of Journal of Gravity. HPC publishing. New York.
- Served as Chair for the Cosmic Microwave Background session at the 2010 Annual conference of the American Astronomy Society in Washington DC.
- Served as Chair for the Dark Matter & Dark Energy session of the 2010 Annual conference of the American Astronomy Society in Washington DC.
- Served as Chair for the cosmology session of the 2012 Annual conference of the American Astronomy Society in Austin, TX.
- Chaired a session on cosmic acceleration at the second Texas Cosmology Network Meeting at the University of Texas at Austin.
- Serving as full member of the Large Synoptic Survey Telescope (LSST) DESC Science Collaboration.
- Served on the Scientific Organizing Committee of the 28th Texas Symposium on Relativistic Astrophysics in Geneva, Switzerland. 479 participants.
- Served as Chair for the cosmology session of the 2017 Annual conference of the American Astronomy Society in Grapevine, TX.
- Served on the Scientific Organizing Committee of the 29th Texas Symposium on Relativistic Astrophysics in Cape Town, South Africa, December 2017.

University Current and Previous Service Contributions:

- Member of the University Academic Senate (2007-2016)
- Member of the University Sustainability Committee (2012-2015)
- Member of the University Faculty Mentoring Committee (2016-present)
- Member of the Senate Advisory Committee on Research (2008-2010)
- Member of the NSM School PPE Committee (2014-present)
- Member of the Physics Graduate Admission Committee (2006-present)
- Member of the Physics Graduate Curriculum Committee (2015-present)
- Member of the Physics Department committee on undergraduate education (2005-2009)
- Member and Chair of the Ph.D. Physics qualifier exam (2006-2014)
- Advisor to the Society of Physics Students (2008-2010)
- Chair of the cosmology faculty search committee (2011,2013,2016)
- Member of space science faculty search committees (2009, 2010)

- Member of the physics faculty development committee (2010-present).
- Member and Chair of faculty third year review (2011, 2012)
- Member and Chair of faculty tenure review (2012, 2016)
- Outside Chair for Ph.D. Final Examinations (one per year)
- Chaired the local and international scientific organizing committees of the 27th Texas Symposium on Relativistic Astrophysics. (Jubilee meeting). The symposium received 470 participants, over 300 talks in 49 parallel sessions; 24 plenary and review talks, and a public lecture attended by over 1300 people.

Journal Referee for:

- Physical Review Letters
- Physical Review D
- Astronomy & Astrophysics
- Classical and Quantum Gravity
- Monthly Notices of Royal Astronomy Society
- General Relativity and Gravitation
- Euro-Physics Letters
- Physics Letters B.

Articles published in refereed journals:

1. Mustapha Ishak
Testing General Relativity at Cosmological Scales
Invited review article in *Living Reviews in Relativity* journal, Springer ISSN-1433-8351. **185 pages**. (2018).
2. Weikang Lin, Mustapha Ishak
Cosmological discordances: a new measure, marginalization effects, and application to geometry vs growth current data sets
Physical Review D 96, 023532 (2017).
3. Weikang Lin, Mustapha Ishak
Cosmological discordances. II. Hubble constant, Planck and large-scale structure data sets,
Physical Review D 96, 083532 (2017).
4. Ji Yao, Mustapha Ishak, Weikang Lin, M. A. Troxel
Effects of Self-Calibration of Intrinsic Alignment on Cosmological Parameter Constraints from Future Cosmic Shear Surveys
Journal of Cosmology and Astroparticle Physics 1710, 056 (2017).
5. Mustapha Ishak
Testing General Relativity at Cosmological Scales
Invited review article in *Living Reviews in Relativity* journal, Springer ISSN-1433-8351. **183 pages**. Content Approved (2017).
6. Weikang Lin, Mustapha Ishak

- Testing gravity theories using tensor perturbations
Physical Review D 94, 123011 (2016).
7. Tharake Wijenayake, Weikang Lin, Mustapha Ishak
Averaged universe confronted with cosmological observations: A fully covariant approach
Physical Review D 94, 083501 (2016).
 8. Weikang Lin, Mustapha Ishak
Ultra faint dwarf galaxies: an arena for testing dark matter versus modified gravity
Journal of Cosmology and Astroparticle Physics 1610, 025 (2016).
 9. Jason N. Dossett, Mustapha Ishak, David Parkinson, Tamara M. Davis. 2015
Constraints and tensions in testing general relativity from Planck and CFHTLenS including intrinsic alignment systematic.
Physical Review D 92, 023003 (2015)
 10. M.A. Troxel, Mustapha Ishak. 2015
The Intrinsic Alignment of Galaxies and its Impact on Weak Gravitational Lensing in an Era of Precision Cosmology. (Invited Review Article).
Physics Reports 558, 1-59, (2015). doi:10.1016/j.physrep.2014.11.001.
 11. Tharake Wijenayake, Mustapha Ishak. 2015
Expansion and Growth of Structure Observables in a Macroscopic Gravity Averaged Universe
Physical Review D 91, 063534, (2015)
 12. M.A. Troxel, Mustapha Ishak. 2014
Cross-correlation between cosmic microwave background lensing and galaxy intrinsic alignment as a contaminant to gravitational lensing cross-correlated probes of the universe.
Physical Review D 89: (2014) 063528.
 13. M.A. Troxel, Austin Peel, Mustapha Ishak..
The effects of structure anisotropy on lensing observables in an exact general relativistic setting for precision cosmology.
Journal of Cosmology and Astroparticle Physics 1403 (2014) 040.
 14. Austin Peel, M. A. Troxel, Mustapha Ishak. 2014
Effect of inhomogeneities on high precision measurements of cosmological distances.
Physical Review D 90, (2014) 123536.
 15. Mustapha Ishak, Austin Peel, M.A. Troxel, 2013.
Stringent Restriction from the Growth of Large-Scale Structure on Apparent Acceleration in Inhomogeneous Cosmological Models. *Physical Review Letters* 111 (2013) 251302.
 16. Jason Dossett, Mustapha Ishak, 2013.
Effects of Dark Energy Perturbations on Cosmological Tests of General Relativity. *Physical Review D* 88 (2013) 103008.

17. M.A. Troxel, Mustapha Ishak, 2013.
Effects of anisotropy on gravitational infall in galaxy clusters using an exact general relativistic model. *Journal of Cosmology and Astroparticle Physics* **12** (2013) 048.
18. Mustapha Ishak, Austin Peel, 2012
The growth of structure in the Szekeres inhomogeneous cosmological models and the matter-dominated era. *Physical Review D* **85** (2012) 083502
19. M. A. Troxel, Mustapha Ishak, 2012
Self-Calibration Technique for 3-point Intrinsic Alignment Correlations in Weak Lensing Surveys. *Monthly Notices of the Royal Astronomy Society* **419** (2012) 1804.
20. Austin Peel, Mustapha Ishak, M. A. Troxel, 2012
Large-scale growth evolution in the Szekeres inhomogeneous cosmological models with comparison to growth data. *Physical Review D* **86** (2012) 123508
21. Jason Dossett, Mustapha Ishak, 2012
Spatial curvature and cosmological tests of general relativity. *Physical Review D* **86** (2012) 103008
22. M. A. Troxel, Mustapha Ishak. 2012
Self-calibrating the gravitational shear-intrinsic ellipticity-intrinsic ellipticity (GII) cross-correlation. *Monthly Notices of the Royal Astronomy Society* **427** (2012) 442.
23. M. A. Troxel, Mustapha Ishak, 2012
Self-Calibration for 3-point Intrinsic Alignment Auto-Correlations in Weak Lensing Surveys *Monthly Notices of the Royal Astronomy Society* **423** (2012) 1663.
24. Jason Dossett, Mustapha Ishak, Jacob Moldenhauer. 2011
Testing General Relativity at Cosmological Scales: Implementation and Parameter Correlations. *Physical Review D* **84**, 123001 (2011).
25. Jason Dossett, Jacob Moldenhauer, Mustapha Ishak. 2011
Figures of merit and constraints from testing General Relativity using the latest cosmological data sets including refined COSMOS 3D weak lensing. *Physical Review D* **84**, 023012, (2011).
26. Anthony Nwankwo, Mustapha Ishak, John Thompson. 2011.
Luminosity distance and redshift in the Szekeres inhomogeneous cosmological models . *Journal of Cosmology and Astroparticle Physics* 1105:028 (2011).
27. Moldenhauer, Jacob; Ishak, Mustapha; Thompson, John; Easson, Damien. 2010.
Supernova, baryon acoustic oscillations, and CMB surface distance constraints on $f(G)$ higher order gravity models. *Physical Review D* **81**: 063514 (2011).

28. Ishak, Mustapha; Rindler, Wolfgang. 2010.
The relevance of the Cosmological Constant for Gravitational Lensing. *General Relativity and Gravitation*. Volume 42, Number 9, 2247-2268.
29. Dossett, Jason; Ishak, Mustapha; Gong, Yungui; Wang, Anzhong. 2010.
Constraints on growth index parameters from current and future observations. *Journal of Cosmology and Particle Astrophysics* 1004: 022 (2010).
30. Ishak, Mustapha; Rindler, Wolfgang; Dossett, Jason. 2010.
More on lensing by a cosmological constant. *Monthly Notices of the Royal Astronomical Society* 403: 2152-2156 (2010).
31. Moldenhauer, Jacob; Ishak, Mustapha. 2009.
A minimal set of invariants as a systematic approach to higher order gravity models: Physical and Cosmological Constraints. *Journal of Cosmology and Particle Astrophysics* 0912:020 (2009).
32. Ishak, Mustapha; Dossett, Jason. 2009.
Contiguous redshift parameterizations of the growth index. *Physical Review D* 80: 043004 (2009).
33. Gong, Yungui; Ishak, Mustapha; Wang, Anzhong. 2009.
Growth factor parameterization in curved space. *Physical Review D* 80: 023002 (2009).
34. Ishak, Mustapha; Moldenhauer, Jacob. 2009.
A minimal set of invariants as a systematic approach to higher order gravity models I. *Journal of Cosmology and Astroparticle Physics* 0901: 024 (2009).
35. Ishak, Mustapha; Richardson, James; Garred David; Whittington Delilah; Nwankwo Anthony; Sussman Roberto. 2008.
Dark Energy or Apparent Acceleration Due to a Relativistic Cosmological Model More Complex than FLRW? *Physical Review D* 78: 123531 (2008).
36. Ishak, Mustapha. 2008.
Light Deflection, Lensing, and Time Delays from Gravitational Potentials and Fermat's Principle in the Presence of a Cosmological Constant". *Physical Review D* 78: 103006 (2008).
37. Ishak, Mustapha; Rindler, Wolfgang; Dossett Jason; Moldenhauer, Jacob; Allison Chris. 2008.
A new independent limit on the cosmological constant/dark energy from the relativistic bending of light by Galaxies and clusters of Galaxies. *Monthly Notices of the Royal Astronomical Society* 388: 1279 (2008).
38. Richardson James; Ishak, Mustapha. 2008.
Inverse approach to Einstein's equations for fluids with vanishing anisotropic stress tensor. *Physical Review D* 77: 044005 (2008).

39. Ishak, Mustapha. 2007.
Remarks on the formulation of the cosmological constant/dark energy questions. *Foundation of Physics Journal* 37:1470-1498 (2007).
40. Hirata, Christopher; Mandelbaum, Rachel; Ishak, Mustapha; Seljak, Uros; Nichol, Robert; Pimblet Kevin; Ross Nicholas; Wake David. 2007.
Intrinsic galaxy alignments from the 2SLAQ and SDSS surveys: luminosity and redshift scalings and implications for weak lensing surveys. *Monthly Notices of the Royal Astronomical Society*, 381, 1197-1218 (2007).
41. Rindler, Wolfgang; Ishak, Mustapha. 2007.
The Contribution of the Cosmological Constant to the Relativistic Bending of Light Revisited. *Physical Review D* 76: 043006.
42. Ishak, Mustapha; Upadhye, Amol; Spergel, David. 2006.
Probing Cosmic Acceleration Beyond the Equation of State: Distinguishing between Dark Energy and Modified Gravity Models. *Physical Review D* 74: 043513 (2006).
43. Mandelbaum, Rachel; Hirata, Christopher; Ishak, Mustapha; Seljak, Uros; Brinkmann, Jonathan. 2006.
Detection of large scale intrinsic ellipticity-density correlation from the Sloan Digital Sky Survey and implications for weak lensing surveys. *Monthly Notices of the Royal Astronomy Society* 367: 611-626 (2006).
44. Ishak, Mustapha. 2005.
Probing decisive answers to dark energy questions from cosmic complementarity and lensing tomography. *Monthly Notices of the Royal Astronomical Society* 363: 469-478 (2005).
45. Ishak, Mustapha; Hirata Christopher. 2005.
Spectroscopic source redshifts and parameter constraints from weak lensing and CMB. *Physical Review D* 71: 023002 (2005).
46. Upadhye, Amol; Ishak, Mustapha; Steinhardt Paul. 2005.
Dynamical dark energy: Current constraints and forecast. *Physical Review D* 72: 063501 (2005).
47. Ishak, Mustapha. 2004.
On Perfect Fluid Models In Non-Comoving Null (Observational) Spherical Coordinate. *Physical Review D* 69: 124027 (2004).
48. Ishak, Mustapha; Hirata Christopher; McDonald, Patrick; Seljak, Uros. 2003.
Weak Lensing and CMB: Parameter forecasts including a running spectral index. *Physical Review D* 69:08314 (2004).
49. Ishak, Mustapha; Lake, Kayll. 2003.
An Inverse Approach to Einstein's Equations for non-conducting fluids. *Physical Review D* 68: 104031 (2003).

50. Ishak, Mustapha; Sussman, Roberto. 2002.
Adiabatic Models of the Cosmological Radiative Era. *General Relativity and Gravitation* 34, No. 10: 1589-1616.
51. Ishak, Mustapha; Lake, Kayll. 2002.
Stability of Transparent Spherically Symmetric Thin Shells and Wormholes. *Physical Review D* 65: 044011 (2002).
52. Ishak, Mustapha; Lake, Kayll. 2002.
Interactive Geometric Database, Including Exact Solutions of Einstein's Field Equations. *Classical and Quantum Gravity* 19: 505-514 (2002).
53. Neary, Nicholas; Ishak, Mustapha; Lake, Kayll. 2001.
The Tolman VII solution, trapped null orbits and w-modes. *Physical Review D* 64: 028001 (2001).
54. Ishak, Mustapha; Chamandy, Luke; Neary, Nicholas; Lake, Kayll. 2001.
Exact solutions with w-modes, *Physical Review D* 64: 024005 (2001).

Articles published in proceedings volumes:

1. Ishak, Mustapha; Richardson, James; Garred David; Whittington Delilah; Nwankwo Anthony; Sussman Roberto. 2010.
Apparent Acceleration Due to Relativistic Cosmological Models More Complex than FLRW as a Possible Alternative to Dark Energy. *Proceedings of the 12th Marcel Grossmann Meeting on General Relativity*, eds. T.Damour, R.Jantzen and R. Ruffini, World Scientific, Singapore, 2010.
2. Ishak, Mustapha. Competing explanations for cosmic acceleration or why is the expansion of the universe is accelerating?
AIP Conference Proceedings of the 8th International Conference on Progress in Theoretical Physics. Volume 1444, pp. 66-76 (2012). (c) 2012: American Institute of Physics.
3. Ishak, Mustapha. 2010
A brief discussion of cosmic acceleration and dark energy problems. *African skies* 14: 9-12 (2010). *Proceedings of the Auresian Workshop on Astronomy and Astrophysics*, Batna, Edited by Peter Martinez, 2010.
4. Ishak, Mustapha; Chamandy, Luke; Lake, Kayll. 2000.
Exact Solutions with w-modes: Scattering of gravitational waves By neutron stars. *Proceedings of the 20th Texas Symposium on Relativistic Astrophysics*, American Institute of Physics. Editors J.C.Wheeler and H. Martel, 2000.
5. Sussman, Roberto; Ishak, Mustapha. Inhomogeneous Cosmologies with Adiabatic Evolution. *Proceedings of Developments in Mathematical and Experimental Physics, Volume A: Cosmology and Gravitation*. Edited by A. Macias, F. Uribe and E. Diaz. Published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002, p.285.

6. Ishak, Mustapha; Musgrave, Peter; Mourra, John; Stern, Jonathan; Lake, Kayll. 1999. GRlite and GRTensorJ: Graphical User Interfaces to the Computer Algebra System GRTensorII, *Proceedings of the Eight Canadian Conference on General Relativity and Relativistic Astrophysics*, American Institute of Physics. Editors C.P. Burgess and R.C. Myers, 1999.

Selected Invited talks, colloquia or key presentations:

1. Why is the expansion of the universe accelerating?
Public Lecture at the Perot Museum of Sciences in Dallas, Dallas, Texas (October, 2017).
2. Why is the expansion of the universe accelerating?
Colloquium presented at University of Texas at Arlington, Arlington, Texas (September, 2017).
3. Cosmological consistency tests of gravity theory and cosmic acceleration.
Testing Gravity Meeting 2017 at Simon Frazer University Vancouver, British Columbia (January, 2017)
4. Why is the expansion of the universe accelerating?
Colloquium presented at Baylor University, Waco, Texas (September, 2016).
5. Why is the expansion of the universe accelerating?
Colloquium presented at the monthly meeting of the Texas Astronomical Society, UT-Dallas Campus (October, 2016).
6. *Exact Solutions to Einstein's Equations in Astrophysics.*
Invited plenary talk presented at 28th Texas Symposium on Relativistic Astrophysics in Geneva, Switzerland (December 2015).
7. *Why is the expansion of the universe accelerating?*
Colloquium presented at the University of Dallas, Irving, Texas (November, 2015).
8. *Why is the expansion of the universe accelerating?*
Colloquium presented at the Texas Christian University, Fort Worth, Texas (November 2015).
9. *Cosmology and Astrophysics at UT-Dallas.*
Invited presentation at *Building Astronomy in Texas Meeting* at Texas A&M, College Station, Texas (September 2015).
10. *Two Big Puzzles in Modern Cosmology: Dark Energy and Dark Matter*
Invited Public Lecture at the Physics Symposium: *Through a Cosmos Darkly* at the South Methodist University, Dallas (April, 2015).

11. *Current Constraints on Dark Energy and Modified gravity*
Invited plenary talk presented at the international meeting on Testing Gravity 2015, Vancouver, Canada (January, 2015).
12. Selected talk presented at the Dark Energy Science Collaboration LSST meeting. University of Pennsylvania, PA (June, 2014).
Testing Gravity at Cosmological Scales
13. Invited talk presented to the Society of Physics Students, UT-Dallas, TX. (October, 2014)
Open Questions in Cosmology.
14. Presentation plus reception of the Robert S. Hyer Award for excellence in research at the Joint Fall 2013 Meeting of the Texas Section of the American Physical Society. "Recent Progress on Testing General Relativity at Cosmological Scales and Implications for Cosmic Acceleration". (Brownsville, TX, October 2013).
15. Invited presentation at the yearly client appreciation event by Cadent Capital. "Our expanding universe: why is the expansion of the universe accelerating?" (Richardson, TX, 2013).
16. Colloquium at the University of Texas at San Antonio, "Why is the expansion of the universe accelerating?" (UTSA San Antonio, TX, 2012)
17. Colloquium at the University of Texas at Dallas, "Why is the universe expansion accelerating?" (UTD Richardson, TX, 2012)
18. Invited Presentation at the NSM Advisory Council meeting, "The UTD Cosmology Research Efforts in Understanding the Problems of Dark matter and Dark Energy." (Richardson, 2012)
19. Colloquium at the Texas A&M at Commerce, "Why is the expansion of the universe accelerating?" (T&M Commerce, TX, 2013)
20. Colloquium at the University of Texas at San Antonio, "Why is the expansion of the universe accelerating?" (UTSA San Antonio, TX, 2012)
21. Colloquium at the University of Texas at Dallas, "Why is the universe expansion accelerating?" (UTD, TX, 2012)
22. Colloquium at Baylor University, "Why is cosmic expansion accelerating?" (Baylor, TX, 2011)
23. Invited plenary talk On Cosmic Acceleration at the Joint Fall 2011 Meeting of the Texas Sections of the APS, AAPT, and Zone 13 of the SPS, Volume 56, Number 7, (Commerce, TX, 2011)

24. Colloquium at University of Oklahoma, “Why is cosmic expansion accelerating?” (Norman, OK, 2011)
25. Invited plenary talk on Cosmic Acceleration at the 8th International Conference on Theoretical Physics at University of Constantine, (Constantine, 2011).
26. Invited parallel talk on Inhomogeneous models and Cosmic Acceleration at the 8th International Conference on Theoretical Physics at University of Constantine, (Constantine, 2011).
27. Colloquium at the University of Texas at Brownsville, Brownsville, TX, 2010.
Why is the expansion of the universe accelerating? One of the biggest puzzles in cosmology!
28. Invited plenary talk at the Texas Astronomy Society, University of Texas at Dallas, Richardson, TX, 2010.
Why is the expansion of the universe accelerating?
29. Colloquium at the University of Texas at Arlington, Arlington, TX, 2010.
Why is the expansion of the universe accelerating? One of the biggest puzzles in cosmology!
30. Refereed talk at the 12th Marcel Grossmann Meeting on General Relativity and Gravitation, UNESCO, Paris, 2009.
Apparent Acceleration Due to Relativistic Cosmological Models More Complex than FLRW as a Possible Alternative to Dark Energy.
31. Invited talk at the Texas Cosmology Network Meeting, University of Texas at Austin, Austin, TX, 2009.
The growth rate index of large scale structure as a probe of cosmic acceleration.
32. Colloquium at Baylor University, Baylor, 2009.
Dark Energy or Apparent Acceleration Due to a Relativistic Cosmological Model More Complex than FLRW?
33. Invited review talk at the Auresian Workshop on Astronomy and Astrophysics, Batna, Algeria, 2008. Cosmic Acceleration: A Review.
34. Colloquium at the University Mentouri, Constantine, Algeria, 2008.
Modern Cosmology: Current status and news challenges.
35. Invited talk given at the STEM event at the University of Texas at Dallas, TX, 2009.
The Invisible Universe – Dark Matter and Dark Energy,
36. Selected presentation at the Origin of Dark Energy Conference, Waterloo, ON, 2007.
Dark Energy versus Modified Gravity Models: Probing Cosmic Acceleration Beyond the Equation of State.

37. Colloquium given at NASA Goddard Space Flight Center, Baltimore, MA, 2006.
Cosmic acceleration: Dark Energy or Modified gravity?
38. Colloquium given at the Southern Methodist University, Dallas, TX, 2006.
Cosmic Acceleration: A Dark Energy Component or a Signature of Modified Gravity at Cosmological Scales?
39. Invited talk at the 1st Texas Cosmology Network Meeting at the University of Texas at Austin, Austin, TX, 2006.
Gravitational Weak Lensing and Cosmic Acceleration
40. Seminar given at the Johns Hopkins University, Baltimore, MD, 2005.
Current and future constraints on Dark Energy parameters,
41. Colloquium given at Austin College, Sherman, TX, 2005.
Recent progress in cosmology and the cosmic acceleration problem.
42. Selected talk at the 3rd Oxford-Princeton Workshop on Cosmology, Princeton, NJ, 2005.
Probing decisive answers to dark energy questions from cosmic complementarity and lensing tomography.
43. Colloquium given at the University of Texas at Dallas, Richardson, TX, 2005.
Dark Energy Questions and Cosmological Probe.
44. Selected talk at the Workshop on Gravitational Lensing, Dark Energy, and Dark Matter at the Ohio Center for Theoretical Science, the Ohio State University, Columbus, OH, 2005.
Dynamical Dark Energy: Current and future constraints from cosmic complementarity and weak lensing tomography.
45. Seminar given at the Gravitational Lensing Workshop at the Institute for Advanced Studies, Princeton-IAS, NJ, (2004). Model-dependent and independent constraints on dark energy from weak lensing (cosmic shear) tomography.
46. Seminar given at the Princeton University & Institute for Advanced Studies joint Gravitational Lensing Seminar. Princeton, NJ, (2004).
Future constraints on Dark Energy from complementary observations and weak lensing
47. tomography (a critical discussion).
48. Seminar given at the Gravity Group at Princeton University, Princeton, NJ, (2003).
Inverse Problems In General Relativity and the Cosmic Acceleration.
49. Invited talk given at the 13th Kingston Theoretical Astrophysics Meeting, University of British Columbia, Vancouver, BC, (2003). Weak Lensing and CMB: Cosmological parameter forecasts including a running spectral index.
50. Seminar given at the Canadian Institute for Theoretical Astrophysics, Toronto, ON, (2002).
GRDB and applications to astrophysics and cosmology.

51. Seminar given at the joint astrophysics seminars of University of Montreal and McGill University, Montreal, QC, (2002). An inverse approach to Einstein Field Equations: fitting cosmological model.

Selected contributed oral presentations at professional meetings and professional workshops attended:

1. Joint Fall 2017 Meeting of the Texas Section of the APS, Texas Section of the AAPT, and Zone 13 of the Society of Physics Students (Dallas, TX, 2017)
Seeking insights on gravity theory and cosmic acceleration from consistency tests between cosmological data sets
2. 229th Annual Meeting of the American Astronomical Society (Grapevine, TX, 2017)
Cosmological consistency tests of gravity theory and cosmic acceleration.
3. LSST-Dark Energy Science Annual Collaboration meeting at SLAC National Accelerator Laboratory – Stanford University (Mento Park, CA, 2017).
Gave introductory talk and chaired two sessions on: Testing modified gravity models: selection criteria for models to be tested by LSST.
4. LSST-Dark Energy Science Annual Collaboration meeting at SLAC National Accelerator Laboratory – Stanford University (Mento Park, CA, 2017).
“Summary talk on working session on Beyond Λ CDM models Testable by LSST Analysis.”
5. 228th Annual Meeting of the American Astronomical Society (San Diego, CA, 2016)
Constraints from Cosmological Data on Expansion and Growth of Structure Observables in a Macroscopic Gravity Averaged Universe.
6. LSST-Dark Energy Science Annual Collaboration meeting at SLAC National Accelerator Laboratory – Stanford University (Mento Park, CA, 2016).
Co-organized session-1 of the Theory and Joint Probes (TJP) working group: Theory beyond Λ CDM and CX5 (Mitigating Systematics)
7. LSST-Dark Energy Science Collaboration Hack-Week Workshop at Carnegie Mellon University (Pittsburgh, PA, 2016).
Worked on Self-Calibration of Intrinsic Alignment of Galaxies.
Gave a talk on classification of Modified Gravity Models and Testing them using LSST.
8. LSST-Dark Energy Science Collaboration meeting at Argonne National Laboratory (Lemont, IL, 2015).
Presentation-1: Interacting models of Dark Energy and Dark Matter
Presentation-2: Self-Calibration of Intrinsic Alignments of Galaxies
9. Special Meeting of the Theory and Joint Probes (TJP) Working Group of the LSST-Dark Energy Science Collaboration. Presentation: Constraints and tensions on MG parameters from Planck, CFHTLenS and other data sets including intrinsic alignment systematic.
10. LSST-Dark Energy Science Annual Collaboration meeting at SLAC National Accelerator Laboratory – Stanford University (Mento Park, CA, 2015).

Short Presentation + discussion about combining cosmological probe constraints and covariances (on behalf of the Theory-Joint-Probes working group).

11. LSST-Dark Energy Science Annual Collaboration meeting at University of Pennsylvania (Philadelphia, PA, 2014).
Participated in Theory-Joint-Probes and Weak-Lensing working group sessions.
12. Cosmo2013 Cosmology Conference. "Testing General Relativity at Cosmological Scales". (Cambridge, UK, 2013).
13. Conference of the American Astronomical Society, AAS Meeting #219, Austin, TX, 2012. New Results from Using Inhomogeneous Cosmological Models in an Era of Precision Cosmology Observations.
14. Conference of the American Astronomical Society, AAS Meeting #215, Washington DC, 2010. On The Growth Rate Index Parameter and Cosmic Acceleration.
15. Conference for the Advancement of Science Teaching. Colleyville, Texas. 2010. Cosmology and Our Universe: Why Dark Energy and is it Real?
16. Sixteenth Annual Meeting of the Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching. Austin. 2010. Cosmology and Our Universe: Why Dark Energy, and is it Real?
17. Conference of the American Astronomical Society, AAS Meeting #212, St-Louis, MI, 2008. The Contribution of The Cosmological Constant/Dark Energy to The Bending of Light Revisited: Applications to Gravitational Lensing, Time Delays and an Upper-bound on The Cosmological Constant.
18. Conference of the American Astronomical Society, Meeting #211, Austin, TX, 2008. Dark Energy or Apparent Acceleration Due to a Relativistic Cosmological Model More Complex than FLRW?
19. Joint Fall Meeting of the Texas and Four Corners Sections of APS, AAPT, SPS, and the Societies of Hispanic & Black Physicists, EL-Paso, TX, 2008. The Contribution of the Cosmological Constant/Dark Energy to The Bending of Light and its Applications.
20. AAS/AAPT Joint Meeting, of the American Astronomical Society, Meeting #209, Bulletin of the American Astronomical Society. Seattle, WA, 2007. Dark Energy versus Modified Gravity Models: Probing Cosmic Acceleration Beyond the Equation of State.
21. AAS/AAPT Joint Meeting, American Astronomical Society Meeting 209, #77.27; Bulletin of the American Astronomical Society, Seattle, WA, 2007. A First Detection of Large-scale Intrinsic Alignments and Implications for Cosmic Shear"

22. Seminar at the University of Texas at Dallas, Richardson, TX, 2006.
A new procedure to distinguish between dark energy models and modified gravity models.
Growth versus expansion.
23. April meeting of the American Physical Society, abstract # I7.002, Dallas, 2006.
A new procedure to distinguish between dark energy models and modified gravity models,
24. American Astronomical Society Meeting 208, #62.01, Vancouver, 2006.
Detection Of Large Scale Intrinsic Ellipticity-Density Correlation From The Sloan Digital Sky Survey And Implications For Weak Lensing Surveys.
25. American Astronomical Society Meeting 207, #126.03; Washington, DC, 2006.
A new procedure to distinguish between dark energy models and modified gravity models.
26. Canadian Astronomical Society meeting at the University of Montreal, Montreal, QC, 2005.
Testing if cosmic acceleration is due to Dark Energy or if it is a symptom of the breakdown of General Relativity on cosmological scale.
27. The International Workshop on Particle Physics and the Early Universe (COSMO-2004), organized by the Canadian Institute for Theoretical Astrophysics. Toronto, ON, 2004.
How and when are we going to constrain dark energy parameters to a satisfactory level of precision?
28. Annual Meeting of the Canadian Astronomical Society, University of Waterloo, Ontario, 2003.
Dark Matter and a Possible Solution for the Acceleration Problems.
29. Tenth Canadian Conference on General Relativity and Relativistic Astrophysics, University of Guelph, Ontario, 2003.
From Inverse Problems in General Relativity to a Possible Solution to the Cosmic Acceleration Problems.
30. Annual Congress of the Canadian Association of Physicists, University of Quebec, QC, 2002.
Perfect Fluid Cosmologies in Null (Observational) Coordinates.
31. Annual Meeting of the Canadian Astronomical Society (McMaster University, 2001, Hamilton, Ontario).
A fitting Approach to Cosmology Using Null (Observational) Coordinates.
32. Seminar at University Autonoma de Mexico, Gravity Group, Mexico, 2000.
A fitting Approach to Cosmology.
33. The 20th Texas Symposium on relativistic Astrophysics, Austin, 2000.
Exact Solutions with w-modes: Scattering of Gravitational Waves by Neutron Stars.