Meng-Ru Wu

Curriculum Vitae

Institute of Physics, Academia Sinica
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Research Interests

Particle astrophysics: neutrino flavor oscillations in dense media; neutrino signals from astrophysical sources; probing bSM physics with astrophysics; quarks in (proto-)neutron stars;

Nuclear astrophysics: nucleosynthesis in core-collapse supernovae and neutron star mergers; neutrino transport; electromagnetic signals from astrophysical transients; chemical evolution of Galaxies.

Education

University of Minnesota, Minneapolis, U.S.A. Doctor of Philosophy, School of Physics and Astronomy	09/2007–10/2012
National Tsing–Hua University, Hsinchu, Taiwan Bachelor of Science, Department of Physics	09/2001–06/2005

Research Employments

Assistant Research Fellow, Institute of Physics, Academia Sinica, Taiwan	09/2017–present
Joint Assistant Research Fellow, Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan	10/2017–present
Junior Center Scientist, National Center for Theoretical Science, Taiwan	01/2020–12/2020
Post-doctoral Researcher, Niels Bohr Institute, Denmark	09/2016–08/2017
Post-doctoral Researcher, Technische Universität Darmstadt, Germany	01/2013–08/2016
Research Assistant, University of Minnesota, U.S.A.	06/2009–10/2012
Research Assistant, National Tsing–Hua University, Taiwan	09/2004–06/2005
Research Assistant, Academia Sinica, Taiwan	07/2003–12/2003

Teaching Experiences

Guest lecturer, Theoretical Astrophysics, Spring 2016, TU Darmstadt, Germany.
Guest lecturer, Nuclear Astrophysics, Fall 2015, Technische Universität Darmstadt, Germany.
Tutor, Nuclear Astrophysics, Fall 2015, Technische Universität Darmstadt, Germany.
Tutor, Nuclear Astrophysics, Fall 2014, Technische Universität Darmstadt, Germany.
Guest lecturer, Nuclear Physics I, Spring 2012, University of Minnesota, U.S.A.
Tutor, Introductory Physics, Spring 2009, University of Minnesota, U.S.A.
Tutor, Introductory Physics, Fall 2008, University of Minnesota, U.S.A.
Tutor, Introductory Physics, Spring 2008, University of Minnesota, U.S.A.
Tutor, Introductory Physics, Fall 2007, University of Minnesota, U.S.A.

Honors and Fellowships

1. Career Development Award, Academia Sinica, 2020.
2. Young Theorist Award, Physics Division, National Center of Theoretical Studies, 2019.
3. Columbus Program Award, MoST, 2018 (declined).
4. EPS Best Poster Prize, Nuclei in the Cosmos XIII, 2014
5. Humboldt Research Fellowship for Postdoctoral Researchers, Alexander von Humboldt Foundation, 2013–2014
6. Aneesur Rahman Award, School of Physics and Astronomy, University of Minnesota, 2012
7. Wilfred Wetzel Summer Research Fellowship, School of Physics and Astronomy, University of Minnesota, 2008
8. Studying Abroad Fellowship of Ministry of Education (Taiwan), 2008–2010
9. Member of Phi Tau Phi Scholastic Honor Society of Republic of China (Taiwan), 2007
10. Scholarship of National Science Council (Taiwan), 2004

Research Grants

1. PI of the AS Career Development Award "Understanding the binary neutron star mergers – developing new computational tools for quantum neutrino transport and r-process nucleosynthesis", 2020-2024.
2. PI of MoST Research Grant "Explore unknown physics properties at the extreme in the era of the multimessenger astronomy", 2019-2022.
3. core member of NCTS Thematic Group "High energy phenomenology", 2021–present.
4. core member of NCTS Thematic Group "Computational and Theoretical Astrophysics", 2021–present.
5. co-PI of NCTS Seed Program "Multimessenger Astrophysics", 2019-2020.
6. co-PI of NCTS ECP2 Program "Light Dark Matter and Neutrinos", 2018-2020.
7. PI of MoST Research Grant "Explore neutrino-, nuclear-, and particle physics using the multimessenger signals of compact astrophysical objects", 2018-2019.
8. PI of Start-up Grant, Institute of Physics, Academic Sinica, 2017-2019.

Advisees

Postdoctoral researchers:

1. Herlik Wibowo, Postdoctoral researcher, Institute of Physics, Academia Sinica, 2020-present.
2. Manu George, Postdoctoral researcher, Institute of Physics, Academia Sinica, 2018-present.
3. Gang Guo, Postdoctoral researcher, Institute of Physics, Academia Sinica, 2019-2020.

4. Huitzu Tu, Postdoctoral researcher, Institute of Physics, Academia Sinica, 2017-2019.

Master students and master-degree research assistants:

1. Heng-Hao Chen, Master student, National Tsing-Hua University, 2021-present.
2. Shih-Jie Huang, Master student, National Taiwan University, 2020-present.
3. Le-Ren Chen, Master student, National ChengChi University, 2020-present.
4. Jr-Hua Lien, Master-degree research assistant, Institute of Physics, Academia Sinica, 2019-present.
5. Shuo-Yen Chen, Master-degree research assistant, Institute of Physics, Academia Sinica, 2020-2021.
6. Yu-Ting Chou, Master student, National Tsing-Hua University, 2019-2020.
7. Veronica Kirsebom, Master student, Niels Bohr Institute, 2016-2017, co-supervised.
8. Max Enders, Master student, TU Darmstadt, 2014-2015, co-supervised.

Undergraduate students and bachelor-degree research assistants:

1. Yu-Hsin Chen, Bachelor student, National Taiwan University, 2020-present.
2. Wen-Hua Wu, Bachelor student, National Taiwan University, 2020-present.
3. Heng-Hao Chen, Bachelor student, National Tsing-Hua University, 2020-2021.
4. Geng-Yu Liu, Bachelor student, National Taiwan University, 2019-2020.
5. Allan Sung, Bachelor student and research assistant, National Taiwan University, 2018-2020.
6. Chun-Hao Chen, Bachelor student, National Chiao Tung University, 2018-2019.
7. Leon Kerber, Bachelor student, TU Darmstadt, 2016-2017, co-supervised.
8. Omar El Sayed, Bachelor student, TU Darmstadt, 2015-2016, co-supervised.

Scientific Activities & Services

- Main organizer of the Miniworkshop on Novel Experimental and Astrophysical Probes for Dark Matter, 05 March 2021, Taipei, Taiwan.
- Organizer of the workshop – Multiscale Feedback on Galaxy Evolution: From Stellar Explosions to Active Galactic Nuclei, 20-22 October 2020, Hsinchu, Taiwan.
- Organizer of the Numerical Astrophysics Summer School: Astrophysical Fluid Dynamics, 04-06 September 2019, Hsinchu, Taiwan.
- Organizer of the Mini-workshop on massive stars, core-collapse supernovae, and nucleosynthesis, 08-09 April 2019, Taipei, Taiwan.
- LOC member, 2018 TIARA Summer School on Origins of the Solar System, 16-20 July 2018, Taipei, Taiwan.
- Main organizer of 3rd Astrophysical Nuclear Reaction Network School, 19-26 August 2016, Schmitten, Germany.

- Organizer of Nuclear Physics Seminar, Spring 2012, University of Minnesota.
- Referee of Science, Physical Review D, Physical Review C, Astrophysical Journal Supplemental Series, Monthly Notice of Royal Astronomical Society, Journal of Physics G, European Physical Journal A, International Journal of Modern Physics D, Astroparticle Physics, Chinese Journal of Physics.
- Deputy Secretary-General of TPS, 2020-present

Publication Lists

Publications in refereed Journals

1. M. George, **M.-R. Wu**, I. Tamborra, R. Ardevol-Pulpillo, H.-T. Janka, "Fast neutrino flavor conversion, ejecta properties, and nucleosynthesis in newly-formed hypermassive remnants of neutron-star mergers", PRD 102 (2020) 10, 103015 [arXiv:2009.04046].
2. G. Guo, Y.-L. S. Tsai, **M.-R. Wu**, Q. Yuan, "Elastic and Inelastic Scattering of Cosmic-Rays on Sub-GeV Dark Matter", PRD 102 (2020) 10, 103004, [arXiv:2008.12137].
3. P. Banerjee, **M.-R. Wu**, Z. Yuan, "Neutron Star Mergers as the Main Source of R-process: Natal Kicks And Inside-Out Evolution to The Rescue", ApJL 902 (2020) 2, L34, [arXiv:2007.04442].
4. J. Tang, T.-C. Wang, **M.-R. Wu**, "Constraining sterile neutrinos by core-collapse supernovae with multiple detectors", JCAP 10 (2020) 038, [arXiv:2005.09168].
5. S. A. Giuliani, G. Martínez-Pinedo, **M.-R. Wu**, L. Robledo, "Fission and the r-process nucleosynthesis of translead nuclei", to appear in Phys. Rev. C [arXiv:1904.03733].
6. G. Guo, Y.-L. S. Tsai, **M.-R. Wu**, "Probing High-Energy Light Dark Matter with IceCube", JCAP 10 (2020) 049, [arXiv:2004:03161].
7. A. M. Suliga, I. Tamborra, **M.-R. Wu**, "Lifting the core-collapse supernova bounds on keV-mass sterile neutrinos", JCAP 08 (2020) 018 [arXiv:2004:11389].
8. T. Fischer, **M.-R. Wu**, B. Wehmeyer, N.-U. F. Bastian, G. Martínez-Pinedo, F.-K. Thielemann, "Core-collapse supernova explosions driven by the hadron-quark phase transition as rare r process site", Astrophys. J. 894, 9 (2020) [arXiv:2003.00972].
9. G. Guo, Y.-Z. Qian, **M.-R. Wu**, "Neutrino Production Associated with Late Bumps in Gamma-Ray Bursts and Potential Contribution to Diffuse Flux at IceCube", Astrophys. J. 890, 83 (2020) [arXiv:1911.07568].
10. T. Fischer, G. Guo, A. A. Dzhioev, G. Martínez-Pinedo, **M.-R. Wu**, A. Lohs, Y.-Z. Qian, "Neutrino signal from proto-neutron star evolution: effects of opacities from charged urrent neutrino interactions and inverse neutron decay", Phys. Rev. C 101, 025804 (2020) [arXiv:1804.10890].
11. A. Suliga, I. Tamborra, **M.-R. Wu**, "Tau lepton asymmetry by sterile neutrino emission – Moving beyond one-zone supernova models", JCAP 1912, 019 (2019).
12. J. R. Westernacher-Schneider, E. O'Connor, E. O'Sullivan, I. Tamborra, **M.-R. Wu**, S. M. Couch, F. Malmenbeck, "Multimessenger Asteroseismology of Core-Collapse Supernovae", Phys. Rev. D 100, 123009 (2019) [arXiv:1907.01138].
13. **M.-R. Wu**, P. Banerjee, B. D. Metzger, et. al., "Finding the remnants of the Milky Way's last neutron star mergers", Astrophys. J. 880, 23 (2019) [arXiv:1905.03793].
14. Z. Xiong, **M.-R. Wu**, Y.-Z. Qian, "Active-sterile Neutrino Oscillations in Neutrino-driven Winds: Implications for Nucleosynthesis", Astrophys. J. 880, 81 (2019), [arXiv:1904.09371].
15. A. Sung, H. Tu, **M.-R. Wu**, "New constraint from supernova explosions on light particles beyond the Standard Model", Phys. Rev. D 99, 121305 (2019), [arXiv:1903.07923].

16. **M.-R. Wu**, J. Barnes, G. Martinez-Pinedo, B. D. Metzger, "Fingerprints of heavy element nucleosynthesis in the late-time lightcurves of kilonovae", Phys. Rev. Lett. 122, 062701 (2019) [arXiv:1808.10459].
17. T. Fischer, N.-U. F. Bastian, **M.-R. Wu**, S. Typel, T. Klahn, D. B. Blaschke, "Quark deconfinement as a supernova explosion engine for massive blue supergiant stars", Nature Astronomy 2, 980 (2018) [arXiv:1712.08788].
18. **M.-R. Wu**, I. Tamborra, O. Just, H.-T. Janka, "Imprints of neutrino-pair flavor conversions on nucleosynthesis in ejecta from neutron-star merger remnants", Phys. Rev. D 96, 123015 (2017) [arXiv:1711.00477].
19. **M.-R. Wu**, I. Tamborra, "Fast neutrino conversions: Ubiquitous in compact binary merger remnants", Phys. Rev. D 95, 103007 (2017) [arXiv:1701.06580].
20. S. Rosswog, U. Feindt, O. Korobkin, **M.-R. Wu**, J. Sollerman, A. Goodbar, G. Martinez-Pinedo, "Detectability of compact binary merger macronovae", Class. Quant. Grav. 34, 104001 (2017) [arXiv:1611.09822].
21. M. Frensel, **M.-R. Wu**, C. Volpe, A. Perego, "Neutrino flavor evolution in binary neutron star merger remnants", Phys. Rev. D95, 023011 (2017) [arXiv:1607.05938].
22. M. Heine, S. Typel, **M.-R. Wu** et. al. (R3B collaboration), "Determination of the Neutron-Capture Rate of ^{17}C for the r-process Nucleosynthesis", Phys. Rev. C 95, 014613 (2017) [arXiv:1604.05832].
23. **M.-R. Wu**, R. Fernández, G. Martínez-Pinedo, B. Metzger, "Production of the entire range of r-process nuclides by black hole accretion disk outflow from neutron star mergers", Mon. Not. R. Astron. Soc. 463, 2323 (2016) [arXiv:1607.05290].
24. J. Barnes, D. Kasen, **M.-R. Wu**, G. Martínez-Pinedo, "Radioactivity and thermalization in the ejecta of compact object mergers and their impact on kilonova light curves", Astrophys. J. 829, 110 (2016) [arXiv:1605.07218].
25. **M.-R. Wu**, H. Duan, and Y.-Z. Qian, "Physics of neutrino flavor transformation through matter-neutrino resonances", Phys. Lett. B 752, 89 (2016) [arXiv:1509.08975].
26. R. Knobel et. al., "First direct mass measurements of stored neutron-rich ^{129,130,131}Cd isotopes with FRS-ESR", Phys. Lett. B 754, 288 (2016).
27. J. Mendoza-Temis, **M.-R. Wu**, K. Langanke, G. Martínez-Pinedo, A. Bauswein, and H.-T. Janka, "Nuclear robustness of the r process in neutron-star mergers", Phys. Rev. C 92, 055805 (2015) [arXiv:1409.6135].
28. **M.-R. Wu**, Y.-Z. Qian, G. Martínez-Pinedo, T. Fischer and L. Huther, "Effects of neutrino oscillations on nucleosynthesis and neutrino signals for an 18 M supernova model", Phys. Rev. D 91, 065016 (2015), [arXiv:1412.8587].
29. **M.-R. Wu**, T. Fischer, L. Huther, G. Martínez-Pinedo and Y.-Z. Qian, "Impact of active-sterile neutrino mixing on supernova explosion and nucleosynthesis", Phys. Rev. D 89, 061303 (2014) [arXiv:1305.2382].
30. J. F. Cherry, **M.-R. Wu**, J. Carlson, H. Duan, G. M. Fuller and Y.-Z. Qian, "Neutrino luminosity and matter-Induced modification of collective neutrino flavor oscillations in supernovae", Phys. Rev. D 85, 125010 (2012) [arXiv:1109.5195].

31. J. F. Cherry, **M.-R. Wu**, J. Carlson, H. Duan, G. M. Fuller and Y.-Z. Qian, "Density fluctuation effects on collective neutrino oscillations in O-Ne-Mg core-collapse supernovae", Phys. Rev. D 84, 105034 (2011) [arXiv:1108.4064].
32. **M.-R. Wu** and Y.-Z. Qian, "Resonances driven by a neutrino gyroscope and collective neutrino oscillations in supernovae", Phys. Rev. D 84, 045009 (2011) [arXiv:1105.2068].

Publications under peer-review

1. A. Bauswein, G. Guo, J.-H. Lien, Y.-H. Lin, **M.-R. Wu**, "Compact Dark Objects in Neutron Star Mergers", submitted to PRD [arXiv:2012.11908].

Conference proceedings

1. F.-K. Thielemann, B. Wehmeyer, **M.-R. Wu**, "r-Process Sites, their Ejecta Composition, and their Imprint in Galactic Chemical Evolution", J.Phys.Conf.Ser. 1668 (2020) 1, 012044.
2. S. Nikas, G. Martínez-Pinedo, **M.-R. Wu**, A. Sieverding, M. P. Reiter, "Exploring the astrophysical conditions for the creation of the first r-process peak, and the impact of nuclear physics uncertainties" HNPS Advances in Nuclear Physics 27, 175 (2020).
3. T. Marketin, A. Sieverding **M.-R. Wu**, N. Paar, G. Martinez-Pinedo, "Microscopic calculations of β-decay Rates for r-process". Acta Phys. Polon. B48, 641 (2017).
4. S.A. Giuliani, G. Martinez-Pinedo, L.M. Robledo **M.-R. Wu** "r-process Calculations with a Microscopic Description of the Fission Process". Acta Phys. Polon. B48, 299 (2017).
5. T. Marketin, A. Sieverding **M.-R. Wu**, N. Paar, G. Martinez-Pinedo, "Beta-delayed neutron emission in Neutron-Rich Nuclei". JPS. Conf. Proc. 14, 020605 (2017).
6. J. Mendoza-Temis, **M.-R. Wu**, K. Langanke, G. Martinez-Pinedo, A. Bauswein, H.-T. Janka, and A. Frank, "On the robustness of the r-process in neutron-star mergers against variations of nuclear masses". J. Phys. Conf. Ser. 730, 012018 (2016).
7. **M.-R. Wu**, G. Martínez-Pinedo, and Y.-Z. Qian, "Linking neutrino oscillations to the nucleosynthesis of elements", EPJ Web Conf. **109**, 06005 (2016) [arXiv:1512.03630]

Contribution to Book Chapter

1. G. Martínez-Pinedo, T. Fischer, K. Langanke, A. Lohs, A. Sieverding, and **M.-R. Wu** "Neutrinos and their Impact on Core-collapse Supernova Nucleosynthesis", "Handbook of Supernvoae", edited by A. W. Alsabti and P. Murdin, Springer (2017).

Presentations

Invited conference/workshop talks

1. "r-process nucleosynthesis in neutron star mergers and kilonovae"
   12/2020, KAGRA International Workshop (hybrid), NCU, Taoyuan, Taiwan.
2. "Probing Light Particles Beyond the Standard Model with Supernovae and Cosmic Rays"
   12/2020, NCTS Annual Theory Meeting, NCTS, Hsinchu, Taiwan.
3. "Review of astrophysical constraints on the axion"
   06/2020, Rapid Response Workshop on New XENON1T Result, ASIoP, Taiwan.
4. "Supernova and compact object neutrinos",
   11/2019, Cosmic Neutrinos and Multi-messenger Workshop "CosNuMM2019", Tsung-Dao Lee Institute, Shanghai, China.
5. "A new constraint on light bSM particles with supernovae",
   10/2019, Intensity Frontier in Particle Physics: Flavor, CP Violation and Dark Physics, NTU & NTHU, Taiwan.
6. "Heavy element nucleosynthesis in neutron star mergers and kilonovae",
   10/2019, 2019 TGWG Conference, Tamkang U & NTNU, Taipei, Taiwan.
7. "Exploring particle and nuclear physics with supernovae and neutron star mergers",
   06/2019, 2019 ASIoP mini-workshop, Institute of Physics, Academia Sinica, Taipei, Taiwan.
8. "The birth and death of neutron stars: particle physics imprints on the multimessenger observables",
   06/2019, The thirteenth particle physics phenomenology workshop, NTNU, Taipei, Taiwan.
9. "r-process nucleosynthesis and kilonovae",
   03/2019, International Molecule-type Workshop "Nucleosynthesis and electromagnetic counterparts of neutron-star mergers: Preparation for the new discovery", YITP, Kyoto University, Japan.
10. "Neutrino and nucleosynthesis in core-collapse supernovae"
    02/2019, Supernova workshop in CUHK, CUHK, Hong Kong, China.
11. "Dark physics confronting supernovae"
    12/2018, 5th International Workshop on Dark Matter, Dark Energy and Matter-antimatter Asymmetry, December 28-31, 2018, NCTS & Fo-Guang-Shan, Taiwan
12. "r-process nucleosynthesis and kilonovae"
    12/2018, Workshop on Physics at HIAF High-Energy Beam Lines and Nuclear Astrophysics, Beihang University, Beijing, China
13. "r-process nucleosynthesis and kilonovae"
    10/2018, The 18^{th} East Asian Numerical Astrophysics Meeting, NCKU, Tainan, Taiwan.
14. "Quark-hadron phase transition in explosion of massive stars"

10/2018, Cross-strait 2018 on Particle Physics and Cosmology, Tamkang University, Taipei, Taiwan.

15. "Particle physics opportunities with hot-and-dense astrophysical environments"
09/2018, Cosmology Frontier in Particle Physics: Astroparticle Physics and Early Universe, NTU, Taipei, Taiwan.
16. "Probing physics at extreme with hot-and-dense astrophysical objects"
09/2018, Taiwanese Theoretical Astrophysics Workshop, ASIAA, Taipei, Taiwan.
17. "Nuclear physics impact on r-process and kilonovae",
06/2018, EMMI Rapid Reaction Task Force: The physics from neutron star mergers at GSI/FAIR, GSI, Darmstadt, Germany.
18. "Nucleosynthesis and neutrino flavor conversions in neutron star mergers"
05/2018, TDLI workshop on the Exploding Universe, SJTU, Shanghai, China.
19. "Fast Neutrino Oscillations and Their Impact in Neutron Star Mergers"
12/2017, NCTS Annual Theory Meeting 2017, NTHU, Hsinchu, Taiwan.
20. "Multi-messenger signals from neutron star mergers",
11/2017, Mini-Workshop on Higgs Physics and Gravitational Waves, NTNU, Taipei, Taiwan.
21. "Multi-messenger aspects of binary neutron star mergers",
11/2017, Mini-workshop on Gravity 2017, NCKU, Tainan, Taiwan.
22. "Supernova Neutrinos: Current Understanding and Future Perspectives",
10/2017, 2017 NCTS Workshop on Dark Matter, Particles and Cosmos, National Dong Hwa University, Hualien, Taiwan,
23. "Role of nuclear physics and neutrinos in the r-process in merger outflows",
08/2017, Observational Signatures of r-process Nucleosynthesis in Neutron Star Mergers, INT-17-2b Workshop, Seattle, USA.
24. "Nucleosynthesis and neutrinos in compact binary mergers",
06/2017, International Symposium on Origin of Matter and Evolution of Galaxies, Daejeon, Korea.
25. "r-process nucleosynthesis in neutron star mergers.",
01/2017, Neutron star mergers: From gravitational waves to nucleosynthesis, International Workshop XLV on Gross Properties of Nuclei and Nuclear Excitations, Hirschegg, Kleinwalsertal, Austria.
26. "Modelling supernova neutrino oscillations",
04/2016, JUNO workshop: neutrino astrophysics, Nanjing, China.
27. "Neutrino properties and impact on nucleosynthesis and core-collapse supernovae",
09/2015, Annual Meeting Matter and Universe, Forschungzentrum Julich, Germany.
28. "On the role of eV-sterile neutrinos in core-collapse supernovae",
06/2015, Neutrinos and Dark Matters in Nuclear Physics 2015, Jyvaskyla, Finland.
29. "Neutrino oscillations and nucleosynthesis of elements",
01/2015, Nuclear Structure and Reactions: Weak, Strange and Exotic, International Workshop XLIII on Gross Properties of Nuclei and Nuclear Excitations, Hirschegg, Kleinwalsertal, Austria.

30. "Sterile neutrinos in supernovae",
    05/2014, Shanghai Particle Physics and Cosmology Symposium, Shanghai, China.
31. "Supernova neutrino signals",
    05/2013, CNA Inauguration Symposium & Workshop, Shanghai, China.
32. "Neutrino oscillations in supernovae",
    06/2012, The 4$^{\text{th}}$ International Symposium on Neutrinos and Dark Matter in Nuclear Physics (NDM12), Nara, Japan.

Contributed conference/workshop talks

1. "Neutron star mergers as the main source of r-process: natal kicks and the inside-out evolution to the rescue",
   09/2020, 2020 ASROC Annual Meeting, ASIAA, Taipei, Taiwan.
2. " Supernova explosions of very massive stars as a rare r-process site",
   02/2020, 2020 Annual Meeting of the Physical Society of Taiwan, National Pingtung University, Taiwan.
3. "Neutrinos and nucleosynthesis in neutron star mergers and kilonovae",
   01/2020, Theory meeting experiment: Particle astrophysics and cosmology, ICISE, Quy Nhon, Vietnam.
4. "r-process nucleosynthesis and kilonovae",
   12/2019, APCTP School/Workshop on Gravitational-Wave Cosmology, Institute of Physics, Academia Sinica, Taipei, Taiwan.
5. "Condition for fast flavor conversion in double neutron star merger remnants",
   08/2019, NBIA-LANL Neutrino Quantum Kinetics in Dense Environments, NBIA, Copenhagen, Denmark
6. "Supernova neutrinos and nucleosynthesis",
   04/2019, Mini-workshop on massive stars, core-collapse supernovae, and nucleosynthesis, Institute of Physics, Academia Sinica, Taipei, Taiwan.
7. "r-process nucleosynthesis yields and their heating rate",
   03/2018, First multi-messenger observations of a neutron star merger and its implications for nuclear physics, INT-JINA Symposium INT-18-72R, Seattle, USA.
8. "Neutrino flavor conversion in binary neutron star mergers",
   12/2017, International Symposium on Cosmology and Particle Astrophysics, YITP, Kyoto, Japan.
9. "Nucleosynthesis and kilonovae from binary neutron star mergers",
   10/2017, Mini-workshop for High-Energy Astrophysics, ASIAA, Taipei, Taiwan.
10. "Nuclear uncertainties on the production of radioactive r-process nuclei",
    08/2017, Electromagnetic Signatures of r-process Nucleosynthesis in Neutron Star Binary Mergers, INT Program INT-17-2b, Seattle, USA.
11. "Nucleosynthesis and neutrinos in compact binary mergers",
    07/2017, Kavli Summer Program in Astrophysics 2017: Astrophysics with gravitational wave detections, Copenhagen, Denmark.

12. "Nucleosynthesis and the electromagnetic signature of binary neutron star mergers", 05/2017, West-Baltic Meeting on Computational and Theoretical Astrophysics, Sandbjerg Gods, Denmark
13. "Neutrinos and core-collapse supernovae", 10/2016, Danish Astroparticle Physics Meeting, University of Southern Denmark, Odense, Denmark.
14. "r-process nucleosynthesis in compact binary mergers", 09/2016, Brainstorming on compact objects, their equation of state, related explosive events, and their nucleosynthesis, Basel University, Basel, Switzerland.
15. "r-process nucleosynthesis in compact binary mergers.", 03/2016, 18$^{\text{th}}$ Workshop on Nuclear Astrophysics, Ringberg Castle, Germany.
16. "r-process nucleosynthesis in neutron star mergers.", 01/2016, NAVI Physics Days, GSI, Darmstadt, Germany.
17. "Neutrino oscillations and supernova nucleosynthesis", 10/2015, HIC for FAIR PAC meeting, GSI, Darmstadt, Germany.
18. "Linking neutrino oscillations to the nucleosynthesis of elements", 06/2015, The 13$^{\text{th}}$ International Symposium on Origin of Matter and Evolution of Galaxies, Beijing, China.
19. "Neutrino oscillations and nucleosynthesis of elements", 03/2015, 79$^{\text{th}}$ DPG Annual Meeting, Heidelberg, Germany.
20. "Neutrinos and nucleosynthesis in supernovae", 02/2015, NAVI Physics Days, GSI, Darmstadt, Germany.
21. "Neutrino oscillations in core-collapse supernovae, nucleosynthesis and the neutrino signals", 08/2014, INT Program 14-2b, Nucleosynthesis and Chemical Evolution, INT, Seattle, USA.
22. "Role of active-sterile neutrino mixing in core-collapse supernovae", 07/2014, INT wrokshop 14-56W, The r-process: Status and challenges, INT, Seattle, USA.
23. "Role of active-sterile neutrino mixing in core-collapse supernovae", 04/2014, 17$^{\text{th}}$ Workshop on Nuclear Astrophysics, Ringberg Castle, Germany.
24. "Light sterile neutrinos in core-collapse supernovae", 03/2014, 78$^{\text{th}}$ DPG Annual Meeting, Frankfurt, Germany.
25. "Neutrinos and explosive nucleosynthesis in core-collapse supernovae", 12/2013, NAVI meeting, GSI, Darmstadt, Germany.
26. "Sterile neutrinos and nucleosynthesis in core-collapse supernovae", 12/2013, MASCHE meeting, TU-Darmstadt, Darmstadt, Germany.
27. "Neutrino oscillations in core-collapse supernovae", 10/2013, Workshop of Supernovae and Gamma-Ray Bursts 2013, Kyoto, Japan.
28. "Light sterile neutrinos in supernovae", 09/2013, International School of Nuclear Physics, 35th Course, Neutrino Physics : Present and Future, Erice-Sicily, Italy.

29. "Neutrino oscillations in core-collapse supernovae",
    03/2013, 77$^{\text{th}}$ DPG Annual Meeting, Dresden, Germany.
30. "Collective neutrino oscillations in a dynamic supernova environment",
    02/2012, Topical Collaboration Meeting for Neutrinos and Nucleosynthesis in hot and dense matter, San Diego, U.S.A.

Seminar/colloquium talks

1. "Probing Light Particles Beyond the Standard Model with Supernovae and Cosmic Rays"
   12/2020, Seminar (remote), Northeastern University, Shenyang, China.
2. "Collective neutrino flavor oscillations"
   12/2020, Seminar, NTU, Taipei, Taiwan.
3. "Finding the origin of heavy elements and exploring the nature of dense matter"
   10/2020, Physics Colloquium, NTU, Taipei, Taiwan.
4. "Fast neutrino flavor conversion, ejecta properties, and nucleosynthesis in newly-formed hypermassive remnants of neutron-star mergers"
   10/2020, Collective oscillations exchange journal club (remote), MPP, Germany.
5. "Finding the origin of elements and exploring the nature of dense matter: challenges and opportunities"
   10/2020, Seminar, Graduate Institute of Applied Physics, NCCU, Taipei, Taiwan.
6. " The r-process nucleosynthesis, kilonovae, and some nuclear physics aspects",
   09/2020, Seminar (remote), SJTU, Shanghai, China.
7. "Probing particle physics with astrophysics",
   09/2020, Physics Seminar, NTNU, Taipei, Taiwan.
8. "The r-process nucleosynthesis: challenges and quests after GW170817",
   08/2020, Center of Astronomy and Gravitation Seminar, NTNU, Taiwan.
9. "The r-process nucleosynthesis: challenges and quests after GW170817",
   08/2020, Astrophysics Colloquium (remote), Radboud University, Nijmegen, Netherlands.
10. "Hadron-quark phase-transition in core-collapse supernovae",
    06/2020, online QCD seminar (remote), KEK-YITP-Kaio, Japan.
11. "Probing High-Energy Light Dark Matter with IceCube",
    05/2020, HEP Seminar, NCTU, Hsinchi, Taiwan.
12. "Probing High-Energy Light Dark Matter with IceCube",
    05/2020, Brookhaven HET virtual seminar (remote), BNL, NY, USA.
13. "Exploring physics at the extreme with particle- and nuclear-astrophysics"
    05/2020, Physics Olympiad Training Camp, NTNU, Taipei, Taiwan.
14. "Probing High-Energy Light Dark Matter with IceCube",
    05/2020, HEP seminar, NTU, Taipei, Taiwan.
15. "Production and impact of sterile neutrinos in core-collapse supernovae",
    11/2019, NCTS/NTHU Joint HEP Seminar, NTHU, Hsinchu, Taiwan.

16. "Hard X-ray excess from nearby neutron stars",
    10/2019, Journal Club talk, ASIoP, Taipei, Taiwan.
17. "Finding the remnants of the Milky Way's last neutron star mergers",
    07/2019, Lunch Talk, ASIAA, Taipei, Taiwan.
18. "Finding the origin of elements and exploring the nature of dense matter: challenges and opportunities",
    03/2019, Colloquium, Institute of Physics, Academia Sinica, Taipei, Taiwan.
19. "Supernovae and neutron stars – explore physics at the extreme",
    11/2018, Physics Colloquium, NDHU, Hualien, Taiwan.
20. "The Gold mine of the universe: r-process nucleosynthesis in explosive astrophysical events"
    05/2018, IoA Colloquium, NTHU, Hsinchu, Taiwan
21. "Neutrinos: a key agent in the cosmos and messenger of extreme physics",
    05/2018, Colloquium, Department of Physics, FJU, New Taipei, Taiwan.
22. "Explore physics at extreme conditions: Signals from core-collapse supernovae and neutron star mergers"
    04/2018, Colloquium, Physics Department, NCKU, Tainan, Taiwan
23. " Quark-hadron phase transition in dying massive stars and its signature"
    04/2018, NCTS-NTHU Seminar, NTHU, Hsinchu, Taiwan
24. "Neutrino flavor oscillations in astrophysical explosions – understanding and implications"
    03/2018, CYCU HEP Seminar, CYCU, Chongli, Taiwan
25. "The Gold mine of the universe: r-process nucleosynthesis in explosive astrophysical events"
    01/2018, IAC Colloquium, NCU, Chongli, Taiwan
26. "Explore physics in extreme conditions: core-collapse supernovae and neutron star mergers"
    12/2017, Colloquium, Physics Department, Tamkang University, Taipei, Taiwan
27. "Neutrino oscillations in energetic astrophysical explosions: a strong coupling system"
    11/2017, NCTU High Energy Physics Seminar, Institute of Physics, NCTU, Taiwan
28. "The Gold mine of the universe: r-process nucleosynthesis in explosive astrophysical events"
    11/2017, ASIAA Colloquium, ASIAA, Taipei, Taiwan
29. "Supernova neutrinos: what do we know and what may we learn?"
    10/2017, LeCosPA Cosmology and Particle Astrophysics Seminar, National Taiwan University, Taipei, Taiwan
30. "Neutrino flavor oscillations in compact astrophysical object: a strong coupling problem driven by weak interaction"
    09/2017, HEP Seminar, Department of Physics, National Taiwan Normal University, Taiwan
31. "Neutron star mergers: an informal discussion on the multi-messenger aspects"
    09/2017, HETG Journal Club, Institute of Physics, Academia Sinica, Taiwan

32. "Compact binary mergers: the gold mine of the universe and the electromagnetic signals"
    01/2017, N-talk, NBIA, Copenhagen University, Denmark
33. "Neutrino flavor transformation in neutrino-dense astrophysical environments"
    09/2016, Astroparticle seminar, NBIA, Copenhagen University, Denmark
34. "Neutrino oscillations in dense neutrino environments",
    07/2016, Theory Seminar, Laboratoire APC, Université Paris Diderot, Paris, France.
35. "Neutrinos: a key agent in the cosmos",
    06/2016, Physics Colloquium, Institute of Physics, Academia Sinica, Taipei, Taiwan.
36. "Neutrino flavor oscillations in supernovae and in neutron star mergers",
    04/2016, Theoretical Physics Division Seminar, Institute of High Energy Physics, Chinese Academy of Science, Beijing, China.
37. "Neutrino oscillations in dense neutrino environments and its astrophysical/cosmological implications",
    03/2016, High Energy Theory Journal Club, Institute of Physics, Academia Sinica, Taipei, Taiwan.
38. "Sterile neutrinos in the early Universe and core-collapse supernovae",
    07/2015, Study group on neutrino and nuclear physics for nucleosynthesis and chemical evolution, Shanghai Jiao Tong University, Shanghai, China.
39. "Neutrino oscillations and nucleosynthesis of elements",
    03/2015, T-2 theory seminar (remote), LANL, USA.
40. "Neutrino oscillations and nucleosynthesis of elements",
    02/2015, Nuclear physics seminar, NSCL, Michigan State University, East Lansing, USA.
41. "Neutrino oscillations in core-collapse supernovae",
    12/2014, Physics Seminar, University of Zagreb, Zagreb, Croatia.
42. "Neutrino oscillations in core-collapse supernovae",
    03/2014, SFB Nuclear Structure Week, TU-Darmstadt, Darmstat, Germany.
43. "The impact of neutrino oscillations on supernova explosion, nucleosynthesis, and the neutrino signals",
    10/2013, Nuclear, Particle, and Astrophysics Seminar, Basel University, Basel, Switzerland.
44. "Neutrino oscillations in core-collapse supernovae",
    01/2013, Lunch Club Seminar, TU Darmstadt. Darmstadt, Germany.
45. "Collective flavor oscillations of the neutronization neutrino burst from O-Ne-Mg supernovae",
    10/2011, Nuclear Physics Seminar, University of Minnesota, Minneapolis, U.S.A.
46. "Resonances and spectral splits of collective neutrino oscillations in supernovae",
    06/2011, Doctoral Training Program Seminar, ECT*, Trento, Italy.
47. "Multi-angle treatment of neutrino oscillations in supernovae",
    03/2011, Nuclear Physics Seminar, University of Minnesota, Minneapolis, U.S.A.
48. "Spectral dependence of collective neutrino oscillations in supernovae",
    12/2010, Nuclear Physics Seminar, University of Minnesota, Minneapolis, U.S.A.

49. "Collective oscillations and spectral splits of supernova neutrinos",
    03/2010, Cosmology and High Energy Astrophysics Seminar, University of Minnesota, Minneapolis, U.S.A.
50. "Spectral splits of supernova neutrinos",
    11/2009, Nuclear Physics Seminar, University of Minnesota, Minneapolis, U.S.A.

Lectures in Schools

1. "Neutrino Astronomy",
   07/2018, PIRE-GEMADARC Summer School Sichuan University, Chengdu, China.
2. "Neutrino Oscillations – Theory",
   07/2018, PIRE-GEMADARC Summer School Sichuan University, Chengdu, China.
3. "The r-process nucleosynthesis in neutron star mergers and the kilonovae",
   03/2018, School/Workshop on Recent Developments in Gravitational Waves and Astrophysics, ASIoP, Taiwan.

Public Talks

1. "Supernovae and neutron stars – explore physics at the extreme",
   10/2018, Academia Sinica Open Day, Institute of Physics, Academia Sinica, Taipei, Taiwan.