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# Burin Gumjudpai

Centre for Theoretical Physics and Natural Philosophy  
Mahidol University, Nakhonsawan Campus, Nakhon Sawan 60130, Thailand

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## RESEARCH INTERESTS

**Gravitation, Cosmology, Thermodynamics, Physics of Social Systems**

## EMPLOYMENTS

- Mahidol University, Nakhonsawan Campus** From 23 Sept 2020  
Centre for Theoretical Physics and Natural Philosophy  
◊ Professor of Theoretical Physics  
◊ Acting Director
- Naresuan University, The Institute for Fundamental Study** 4 March 2019 - 20 Sept 2020  
◊ Professor of Theoretical Physics
- Naresuan University, The Institute for Fundamental Study** Feb. 2013 - 3 March 2019  
◊ Associate Professor of Theoretical Physics (Special Track: overpassing assistant professorship)
- Naresuan University, The Institute for Fundamental Study** June 2011- Feb. 2013  
◊ Lecturer
- Naresuan University, Department of Physics** July 1996-May 2011  
◊ Lecturer
- University of Portsmouth, Department for Teaching and Learning** 2002-2003  
◊ P/T Lecturer in Mathematics and Sciences Skills
- University of Portsmouth, School of Mathematics & Computer Science** 2001-2002  
◊ Teaching Assistant in Astronomy
- NEW YORK UNIVERSITY** (1 week)  
Center for Cosmology and Particle Physics  
Department of Physics Sept 2018  
◊ Visiting Researcher (Host: Prof. Matthew Kleban)
- UNIVERSITY OF THE THAI CHAMBER OF COMMERCE**  
The University of Chicago-UTCC Research Center Aug 2014-July 2015  
◊ Visiting Researcher (Host: Assist. Prof. Weerachart Kilenthong)
- QUEEN MARY, UNIVERSITY OF LONDON** (1 week) May 2012  
Astronomy Unit  
◊ Visiting Researcher (Prof. Reza Tavakol)
- UNIVERSITY OF DURHAM** (8 months) 2011-2012  
Institute for Particle Physics Phenomenology  
◊ Visiting Researcher (Host: Prof. Ruth Gregory)
- UNIVERSITY OF CAMBRIDGE** (1 year) 2008-2009  
Department of Applied Mathematics and Theoretical Physics  
◊ Visiting Scholar (Host: Prof. Anne C. Davis)
- NATIONAL INSTITUTE OF DEVELOPMENT ADMINISTRATION** 2015-2020  
Graduate School of Development Economics  
◊ M.Econ. (Financial Economics)

## EDUCATION

Dissertation Title: *Thermodynamics Formulation of Economics*  
Supervisor: Assoc. Prof. Yuthana Sethapramote

**University of Portsmouth**, Institute of Cosmology and Gravitation 2000-2003  
◊ Ph.D. in Cosmology  
Dissertation Title: *Braneworld Effects on Cosmological Dynamics*  
Supervisor: Prof. Roy Maartens

**University of Sussex**, Centre for Theoretical Physics 1998-1999  
◊ M.Sc. in Physics  
Dissertation Title: *Tunnelling in Field Theory*  
Supervisor: Dr. Mark B. Hindmarsh

**Chiang Mai University**, Department of Physics 1991-1996  
◊ B.S. (Physics)  
Senior Project Title: *Ferroelectric Properties of Barium Titanate Single Crystal*  
Advisor: Dr. Gobwute Rujjanakul

HONORS  
& AWARDS

**Richard Newbold Adams Medal** | 2020  
International Association for the Integration of Science and Engineering (IAISAE)

**Royal Society-Newton Advanced Fellow** | 2018-2020  
The Royal Society of London - Thailand Research Fund

**TRF Advanced Research Scholar** | 2010-2013 (1st round) and 2017-2020 (2<sup>nd</sup> round)  
Thailand Research Fund

**TTSF Research Grant** | 2009  
Thailand Toray Science Foundation

**Member** | elected 2016 (**Fellow** | elected 2008)  
Thailand Academy of Science and Technology

**ICTP Junior Associateship** | 2008-2015  
The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy

**Thailand Young Scientist Award** | 2008  
Foundation for the Promotion of Science and Technology under the Patronage of His Majesty the King

**Honorable Mention, NRCT Thesis Prize in Physical Science and Mathematics** | 2007  
The National Research Council of Thailand

**Naresuan University Outstanding Researcher Prizes**  
(winner of 5 prizes in 2006, 2007, 2008 and 2009)  
Naresuan University

**The TRF-CHE Outstanding New Researcher Award** | 2005  
The Thailand Research Fund & Commission on Higher Education, Thailand

**F.R.A.S.** | elected 2003  
Fellow of the Royal Astronomical Society, U.K.

SELECTED  
PUBLICATIONS

C. Kritpetch (IF), C. Muhammad (IF) and B. Gumjudpai (IF and ThEP)  
“Holographic dark energy with non-minimal derivative coupling to gravity effects”  
Phys. Dark Univ. 30, 100712 (2020) [arXiv: 2004.06214 [gr-qc]]

B. Gumjudpai (IF)  
“Thermodynamics Formulation of Economics”  
Proc. Int. Conf. Thermo. 2.0, MA, July 2020

B. Gumjudpai (DAMTP & TPTP) and J. Ward (U. Victoria)  
“Generalised DBI-Quintessence”  
Phys. Rev. D 80, 023528 (2009) [arXiv: 0904.0472 [astro-ph.CO]]

D. Samart (TPTP) & B. Gumjudpai (TPTP)  
“Phantom Field Dynamics in Loop Quantum Cosmology”  
Phys. Rev. D 76, 043514 (2007), arXiv:0704.3414 [gr-qc]

B. Gumjudpai (TPTP), T. Naskar (IUCAA) and J. Ward (Queen Mary London)  
“A Quintessentially Geometric Model”  
JCAP 11(2006)006, [arXiv: hep-ph/0603210]

B. Gumjudpai (TPTP), T. Naskar, M. Sami (IUCAA) and S. Tsujikawa (Gunma Coll.)  
“Coupled Dark Energy: Towards a General Description of the Dynamics”  
JCAP 06(2005)007 (2005) [arXiv: hep-th/0502191]

#### INVITED REVIEWS

B. Gumjudpai (DAMTP & TPTP)  
“Scalar Field Cosmology: Its Non-Linear Schrödinger-Type Formulation”  
Ch.4 in Dark Energy-Current Advances and Ideas, Research Signpost 2009  
[arXiv: 0904.2746 [gr-qc]]

#### SELECTED INVITED TALKS

Invited Talk “Eddington-Born-Infeld and Eddington-inspired Gravity”  
The 2nd Sino-Thai Symposium on High Energy Physics, Astrophysics and Beyond  
(STSP2012), Suranaree University of Technology, Nakhon Rachasima (2012)

Invited Lecture on Cosmology  
The 1st CERN School Thailand 2010, Chulalongkorn University, Bangkok

Invited Talk “Dark Energy and Acceleration of the Universe”  
The 34th Congress on Science and Technology of Thailand 2008 (STT 34th), Bangkok

Invited Talk “Coupled Phantom Field in Loop Quantum Cosmology”  
The SIAM Physics Congress 2007 and the Thai National Astronomy Meetings 2007  
Nakhon Prathom

Plenary Talk “Modern Cosmology Research in Thailand”  
The 1st National Symposium on Physics Graduate Research (2006), Chaiyaphum

#### SELECTED SEMINARS

“Non-Minimal Derivative Coupling Gravity in Palatini Formalism”  
The 9th Aegean School on Gravitational Physics (2017) Ateomonas, Sifnos, Greece

“Canonical Scalar Field Cosmology in Non-Linear Schrödinger-Type Formulation”  
Cosmology Seminar, Astronomy Centre, University of Sussex (9 Dec 2008)

“Scalar Field Cosmology with NLS Formulation”  
Cosmology Lunch: joint DAMTP-IoA-Cavendish Seminar, at DAMTP, Cambridge  
(9 June 2008)

“Phantom Field Dynamics in Loop Quantum Cosmology”  
The 4th Aegean School on Black Holes (2007) Mytilini, Island of Lesbos, Greece

#### JOURNALS/ CONFERENCES REFEREEING

◇ Monthly Notice of the Royal Astronomical Society (since 2012)  
◇ European Physical Journal C (since 2008)  
◇ General Relativity and Gravitation (since 2017)  
◇ Thai Journal of Physics: Proc. of the SIAM Phys. Cong. (since 2007)

◇ Congress on Science and Technology of Thailand (STT) (The 36th-2010)

PROFESSIONAL  
CONTRIBUTION

◇ Deputy Director of Strategies (April 2014-present), Deputy Director of Academics (2013) (2013-March 2014), The Institute for Fundamental Study, Naresuan University  
◇ Acting Director, Naresuan University Academic Center of Excellence in Physics (2012-2013)  
◇ Founder, The Institute for Fundamental Study, Naresuan University  
◇ Head of the Cosmology Research Laboratory, Thailand Center of Excellence in Physics (2009-2014)  
◇ Advisory Committee: NSTDA Thai Science Communication Center (2007-2008)  
◇ Program Committee: The SIAM Physics Congress (in 2007 & 2008)  
◇ Chair, Theo. Astrophys. & Cosmol. WG, South-East Asian Astron. Network (SEAAN) (since 2007-2011)  
◇ Founder & Headmaster: The Tah Poe Acad. Inst. for Theo. Phys. & Cosmol. (TPTP)  
◇ Founder, SOC:  
The Tah Poe School on Cosmology I, II, III, IV (2002, 2003, 2004, 2017)  
◇ Founder, Chair of SOC: The Siam GR+HEP+Cosmo and Theoretical Physics Symposium I, II, III, IV, V (2003, 2004, 2005, 2009, 2014)

TEACHING  
EXPERIENCE

**Naresuan University Department of Physics Undergraduate Courses:**

◇ Introductory Physics ◇ Medical Physics ◇ Physics I ◇ Physics II ◇ Philosophy of Science  
◇ Scientific Methods in Physics ◇ Classical Mechanics I ◇ Thermal Physics  
◇ Waves and Vibrations ◇ Modern Physics ◇ Quantum Mechanics II  
◇ Introduction to General Relativity and Gravitation  
◇ Introductory Cosmology ◇ Particles and Fields

**Naresuan University Department of Physics Graduate Courses:**

◇ Classical Dynamics  
◇ General Relativity  
◇ High Energy Physics  
◇ Relativistic Cosmology

**The Institute for Fundamental Study, Graduate Courses given in English:**

◇ Non-Linear Dynamics and Chaos (2020)  
◇ Equilibrium Thermodynamics (2015, 2017)  
◇ Classical Dynamics (2016, 2018)  
◇ Cosmology I (2013, 2014)  
◇ Particles and Fields (2013)  
◇ Dark Energy and Modifications of Gravities (2014)

REFERENCES

Prof. Mark B. Hindmarsh  
Department of Physics and Astronomy  
School of Science and Technology, University of Sussex  
Brighton, BN1 9RH, UK

Prof. Roy Maartens  
Institute of Cosmology and Gravitation  
Dennis Sciama Building  
Burnaby Road  
Portsmouth, PO1 3FX, UK

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Homepage: <http://www.if.nu.ac.th/personal/burin>