

THE INSTITUTE FOR FUNDAMENTAL STUDY

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📘 The Institute for Fundamental Study

📺 IF Channel





What is IF?

The Institute for Fundamental Study “The Tah Poe Academia Institute” (IF, formerly the TPTP) is a research institute established as the 21st faculty of Naresuan University, Thailand. IF academic mission is to provide research and academic programs in Theoretical Physics and other related disciplines. IF also accommodates the previous TPTP former activities, e.g. the Tah Poe Lecture Course, the Tah Poe Seminar Series. IF is hence the legitimate physical body of the pre-existing TPTP. (The Crossing Examination stopped running since 9th November 2015.)

IF official inauguration was announced on 14 March 2011, retroactive from 30 January 2011 by Naresuan University Council. IF’s origin as the TPTP can be traced back from the 1st Jan 1994 as Students’ Forum for Theoretical Physics (SFTP) at Chiang Mai University. The SFTP was reformed to the Tah Poe Group of Theoretical Physics (TPTP) at Naresuan University on the 8th August 1996. In 2006 the group was renamed the Tah Poe Academia Institute for Theoretical Physics (also called the TPTP) until its official inauguration as IF in 2011. (Read IF’s history.)





Course Objectives




The difference between this course and the M.Sc. (Physics) offered by the Department of Physics in the Faculty of Science at several American universities is that the M.Sc. (Theoretical Physics) offers all subjects that build on knowledge from a bachelor's degree program in a single step. (as a result, there are no consecutive Quantum Mechanics I and Quantum Mechanics II courses.) as well as focuses on learning to cover a wide range of theoretical physics (before studying at the advanced level, obtain a High. Grad. Dip.) and reiterating and building on theoretical topics taught throughout the bachelor's degree. Graduates will get not only a Naresuan University M.Sc. (Theoretical Physics) degree, but also a Master's degree at Tha Poe School Institute (M.TP.) in accordance with the Institute's traditions.





Coursework

Compulsory Courses	Number	16	Credits
897501	Mathematical Structures for Theoretical Physicists		
897502	Mathematical Skills for Theoretical Physicists		
897511	Thermodynamics and Statistical Mechanics		
897520	Non-Relativistic Quantum Mechanics		
897561	Classical Dynamics		
897562	Classical Electrodynamics and special Relativity		





Coursework

Elective Courses	Not less than	8	Credits
897503	Green's Function and Propagation		
897504	Group Theory, Gauge Theories, and Standard Model		
897505	Dynamical Systems		
897506	Special Topics in Mathematical physics		
897521	Relativistic Quantum Mechanics		
897522	Quantum Mechanics and Path Integrals		
897523	Advanced Non-Relativistic Quantum Mechanics		
897524	Introduction to Quantum Information Science and Technology		





Coursework

Elective Courses	Not less than	8	Credits
897525	Quantum Information		
897526	Quantum Computation		
897527	Introduction to Quantum Hardware		
897528	Special Topics in Quantum Information		
897529	Special Topics in Atomic Physics and Quantum Optics		
897551	Introduction to General Relativity		
897552	Introduction to Black Holes		
897553	Introduction to Modified Gravity Theories		





Coursework

Elective Courses	Not less than	8	Credits
897554	Special Topics in Gravity Theories		
897563	Quantum Field Theory		
897564	Introduction to String Theory		
897565	Introduction to Scattering Amplitude		
897566	Geometric Mechanics		
897567	Special Topics in High Energy Physics		
897571	Cosmology 1		
897572	Cosmology 2		





Coursework

Elective Courses	Not less than	8	Credits
897573	Special Topics in Cosmology		
897581	Data Science for Physicists		
897582	Introduction to Optimization		
897583	Machine Learning and Applied Optimization		
897584	Special Topics in Computational Physics		





Coursework

Thesis	Number	12	Credits
897591	Thesis 1, Type A 2		
897592	Thesis 2, Type A 2		
897593	Thesis 3, Type A 2		

Non-credit courses	Number	4	Credits
897500	Research Methodology in Science and Technology		
897599	Seminar		





Study Plan

Year 1

1st Semester

897500	Research Methodology in Science and Technology	3(3-0-6)
897501	Mathematical Structures for Theoretical Physicists	2(2-0-4)
897520	Non-Relativistic Quantum Mechanics	3(3-0-6)
897561	Classical Dynamics	3(3-0-6)

Total 8 Credits

2nd Semester

2(1-2-3)	Mathematical Skills for Theoretical Physicists	897502
3(3-0-6)	Thermodynamics and Statistical Mechanics	897511
3(3-0-6)	Classical Electrodynamics and special Relativity	897562
3 Credits	Thesis 1, Type A 2	897562
1(0-2-1)	Seminar	897599

Total 11 Credits





Study Plan

Year 2

1st Semester

8975xx	Elective course	x(x-x-x)
8975xx	Elective course	x(x-x-x)
8975xx	Elective course	x(x-x-x)
8975xx	Elective course	x(x-x-x)
897592	Thesis 2, Type A 2	3 Credits

Not less than 11 Credits

2nd Semester

6 Credits

Thesis 3, Type A 2

897593

Total 6 Credits

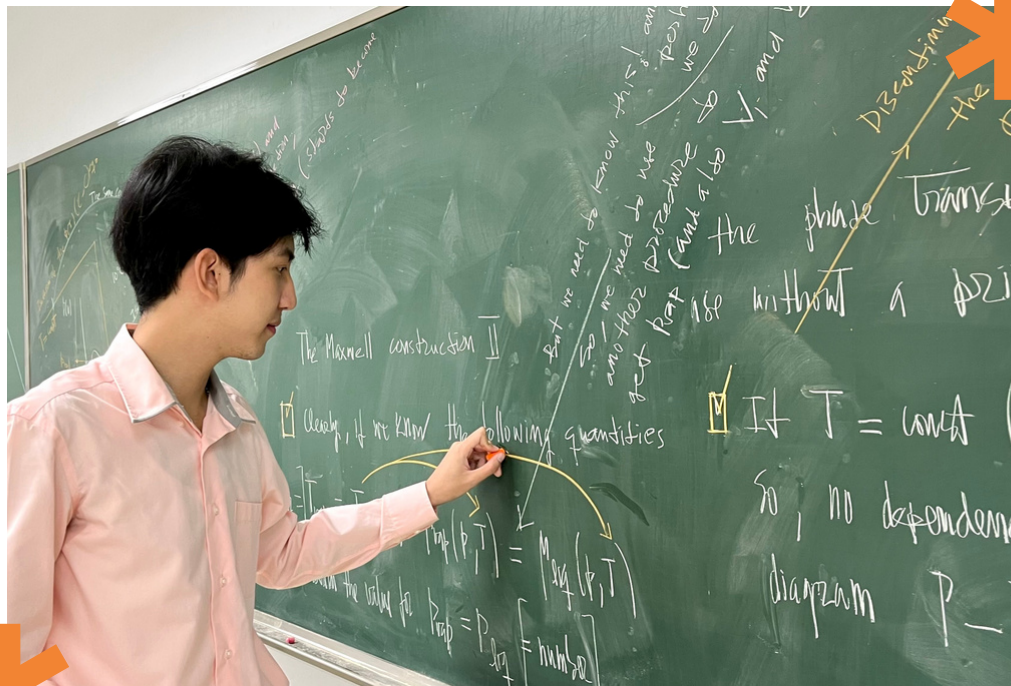




* Admission requirements

Applicants should hold a degree majoring in Physics, Applied Physics, Applicants must pass an interview for basic knowledge in physics and mathematics at the bachelor's degree level. Physics Education, Mathematics, Applied Mathematics or Engineerings.

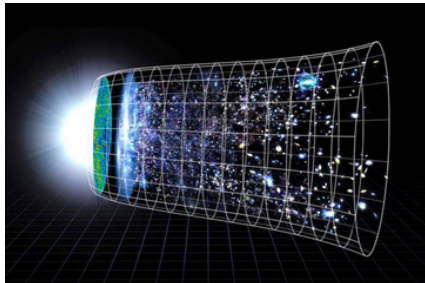
For more information, please contact jirachayach@nu.ac.th Tel. 0-5596-8736



- The program is given in English.
- Broaden general aspects of basics of theoretical physics prior to advanced topics
- Coursework and thesis work
- Ideal as a preparation step for advanced courses in the High. Grad. Dip. (Quantum Fields, Gravitation and Cosmology) or Ph.D. program Two years (four-semester program)
- Preliminary degrees: Bachelor degree in Physics, Mathematics, Applied Physics and Engineering
- Classes run on weekdays.
- Admission twice a year both in the first semester and second semester
- Tuition fee is 32500 THB/semester. (130,000 THB in total) and foreign student 47,500 Baht per semester (excl. the viva voce exam)



Research



Laboratory of Cosmology and Gravity (CGL)

Hosted at the CGL is the Computational Astrophysics and Cosmology Research Unit – CACR

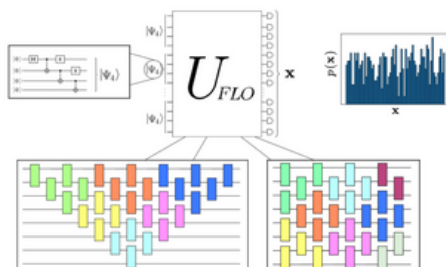
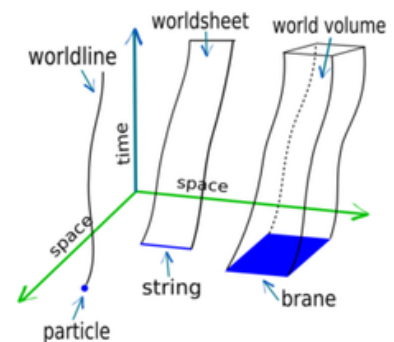
Research Topics

- Modified Gravities
- Dark Energy
- String Cosmology
- Inflation

Laboratory of Integrability, Field Theories and High Energy Physics (IFTHEP)

Research Topics

- Mathematical Physics (Integrable Systems)
- String Theory
- Topological Field Theories
- Modern Aspects of Quantum Field Theory (Gauge Theory, Renormalization Theory, Gauge-Gravity Duality)



Laboratory of Quantum information science (QIS)

Research Topics

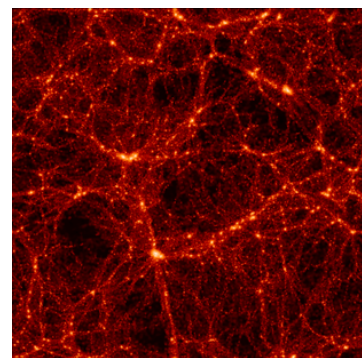
- Quantum Information and Computation
- Mathematical Structure of Quantum Theory
- Quantum Foundations

Computational Astrophysics and Cosmology Research Unit (CACR)

a research group under Laboratory of Cosmology and Gravity (CGL) of the Institute for Fundamental Study.

Research Topics

- Cosmic Microwave Background
- Large Scale Structure of the Universe
- Computational Astrophysics



Faculty Members

คณะผู้บริหาร



**Assistant Professor
Narongrit Maneejiraprakarn**

Areas of Expertise : Signals | Innovations

- Assistant Professor of Applied Physics
- Headmaster of the TPTP
- IF Director

**Assistant Professor
Dr.Suchittra Sa-nguansin**

Areas of Expertise : Applied Mathematics

- Assistant Professor of Mathematics (affiliated to Dept. of Maths)
- IF Deputy Director of Academics



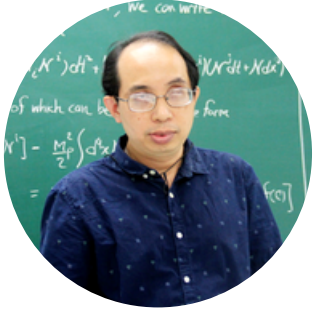
**Assistant Professor
Dr.Sikarin Yoo-Kong**

**Areas of Expertise : Mathematical Physics
| Integrable Systems**

- Assistant Professor of Physics
- Coordinator of the IF Colloquium Online Seminar Series
- IF Deputy Director of Strategy



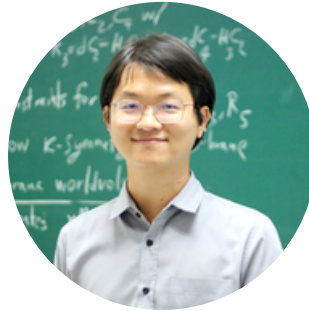
Associate Professor Dr.Khamphee Karwan



Areas of Expertise : Cosmology | Gravity

- Associate Professor of Physics
- (over-passing Assist. Prof.)
- TRF Research Scholar (2nd Round)
- Head of the CGL
- DPST Scholar

Associate Professor Dr.Pichet Vanichchajongjaroen



Areas of Expertise : High Energy Physics | String Theory

- Associate Professor of Theoretical Physics
- Head of the IFTHEP Lab
- Head of String Theory Group (within the IFTHEP)
- DPST Scholar

Assistant Professor Dr.Seckson Sukhasena



Areas of Expertise : High Energy Physics | Quantum Field Theory

- Assistant Professor of Theoretical Physics

Assistant Professor Dr.Pitayuth Wongjun

Areas of Expertise : Cosmology | Gravity

- Assistant Professor of Physics



DPST

Faculty Members

Faculty Members

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**Assistant Professor
Dr. Teeraparb Chantavat**

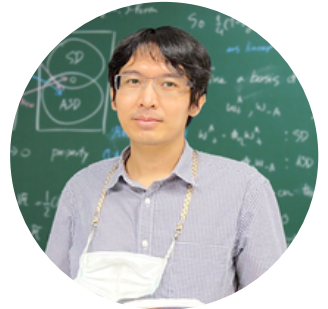
**Areas of Expertise : Extra-galactic
Astrophysics | Computational Cosmology**

- Assistant Professor of Astrophysics
- Head of the CACR Unit (within the CGL)
- DPST Scholar

Dr. Ninnat Dangniam

**Areas of Expertise : Quantum Information
and Computing**

- Lecturer
- Head of the QIS Lab



Dr. Pongwit Srisangyingcharoen

**Areas of Expertise : String theory |
Scattering Amplitudes**

- Lecturer
- Organizer of the Tah Poe Seminar Series



Professor Dr. Salvatore De Vincenzo

**Areas of Expertise : Quantum Mechanics
| Relativistic Quantum Mechanics**

- Foreign Expert Faculty Member



Dr. Chun-Hung Chen

Areas of Expertise : Cosmology | Gravity

- Lecturer
- Organizer of the Tah Poe Seminar Series

