Department of Physics

Mahidol University

Bachelor Degree in Physics

	Regular Program	Distinction Program
Specific Courses	94 credits	102 credits
	(12 are selective)	(7 are selective)
Free Elective	6 credits	6
General Education	30 credits	30 credits

Students with distinction program degree can go directly to Ph.D. program.

Study Plans

Year1	**General Biology I and II , Biology Laboratory** **General Chemistry I and II , Chemistry Laboratory** **Physics I and II , Introductory Physics Laboratory** **Calculus , Ordinary Differential Equations** **English Level 1 and 2** **Art of Using Thai Language in Communication** **General Education for Human Development**
Year2	Advanced Calculus, Differential Equations, Linear Algebra, Prob and Stat. Classical Mechanics I Thermodynamics Modern Physics Intermediate Physics Laboratory I and II Computer Programming Quantum Mechanics I Electromagnetism I

Study Plans

	Regular Program	Distinction Program
Year3 semester1	Statistical Mechanics Electronics Vibrations Waves and Optics Seminar I Advanced Physics Laboratory I Selective I	Statistical Mechanics Electronics Vibrations Waves and Optics Seminar I Advanced Physics Laboratory I Complex Analysis for Physicists Electromagnetism II
Year3 semester2	Computational Physics I Atomic and Nuclear Physics Advanced Physics Laboratory II Seminar II Selective II	Computational Physics I Atomic and Nuclear Physics Advanced Physics Laboratory II Seminar II Classical Mechanics II Quantum Mechanics II

Study Plans

	Regular Program	**Distinction Program**
Year4 semester1	Training Seminar III Project in Physics I	Training Seminar III Research Project I
Year4 semester2	Seminar IV Project in Physics II	Seminar IV Research Project II

Research Groups

Applied Optics & Lasers Application

Biological Physics

Condensed Matter Physics

Geophysics

Nanotechnology

Nonlinear Systems

Physics Education

Optical & Quantum Physics

Space Physics & Energetic Particles + Astrophysics

Scientific Computing

CONDENSED MATTER PHYSICS

Research activities

- Strongly correlated electron systems
- Quantum magnetism
- Tomonaga-Luttinger liquid
- Tunnelling junctions and spintronics
- Electron transport in semiconductor devices
- Mossbauer spectroscopy of magnetic materials
- Magnetic Semiconductors
- Magnetic Heterostructures
- Magnetocrystalline Anisotropy
- Planar Hall Effect
- Electronic structures of ferroelectric materials
- Rare earth nitrides, transition metal nitrides
- Two dimensional materials
- Low-dimensional electron systems
- Spin-charge separation
- Quantum shot noise
- Semiconductor nano structures
- Graphene and Carbon nanotubes.

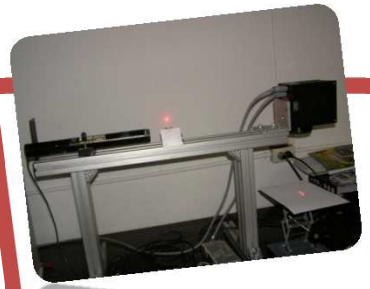
Applied Optics & Laser Applications

Ratchapak Chitaree

Chernchok Soankwan

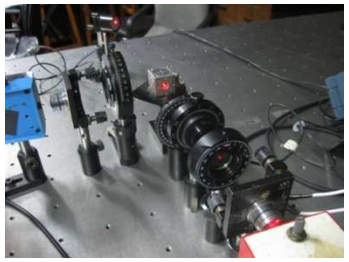
Kwan Arayathanitkul

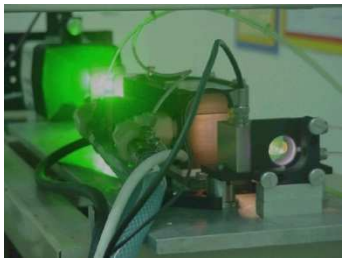
Narumon Emarat



Research activities

- Design of waveguides based on photonic crystal structures
- Applications of interferometric techniques for thin film measurement
- Force sensing applications using the long period fiber grating structure
- **Forensic Science**





Optical & Quantum Physics

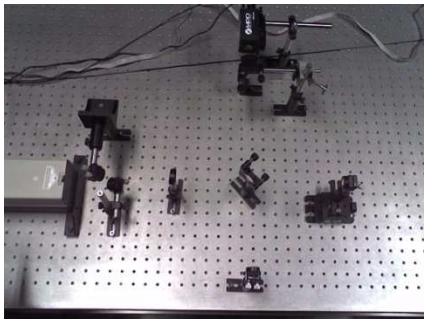






Asawin Sinsarp **Withoon Chunwachirasiri** **Sujint Wangsuya** **Sujint Suwanna**

Malliga Suewattana **Pichet Kittara** **Wisit Singhsomroje**



Research activities

- Single photon generation
- Single photon and entangled photon phenomena
- Photon-phonon interactions
- Quantum information with optic platform
- Quantum cryptography and applications
- Random generator
- Quantum properties of materials
- Optical metrology.

Physics Education

Ratchapak Chitaree

Chernchok Soankwan

Kwan Arayathanitkul

Narumon Emarat

Research activities

- Conceptual understanding
- Active learning
- Teaching strategies
- Media
- Assessment

Tanakorn Osotchan

Toemsak Srikhirin

Somsak Dangtip

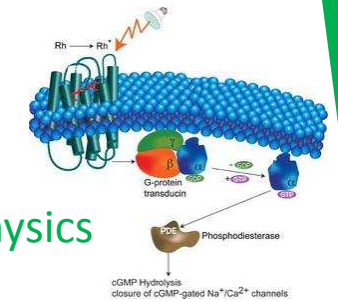
Teerakiat Kerdcharoen

Research activities

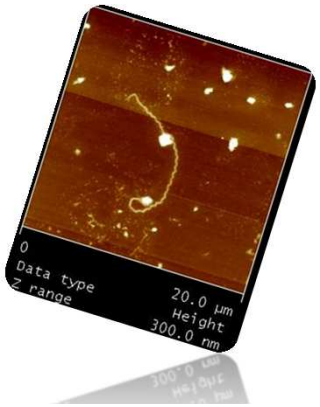
- Nanodevice Engineering : Biomedical Sensor, Organic Light, Molecular Electronics, Aritificial Olfactory System, Organic Solar Cell
- Nanomaterials : Nonoparticles and Quantum Dots, Surface Treatments, Polymer-clay Nano-composites, Carbon Nanotubes
- Bio-Nanoscience : Molecualar Biophysics of Protein Channel, Biomimetics and Membrane-Protein Interactions

Biological Physics

Research activities



- Protein Dinamics
- Leptospirosis Biophysics
- Nano-Toxicity
- Cancer Modelling
- Nonlinear Fractal analysis
- Signal Transductions
- Microfluidics
- HIV Apheresis
- Physics of Cell Membrane



Wannapong Triampo

Narin Nuttavut

Charin Modchang

Geophysics

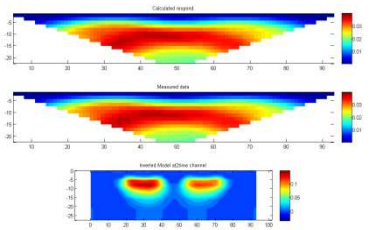
Weerachai Siripunvaraporn

Puwis Amatyakul

Sutthipong Noisagool

Research activities

- Magnetotelluric
- DC Resistivity & Induced Polarization
- Shallow seismic
- Earthquake & Broadband seismic
- Geomagnetic & Deep Earth studies



Space Physics & Energetic Particles

David Ruffolo

Alejandro Saiz

Warit Mitthumsiri

Petchara Pattarakijwanich

Astrophysics

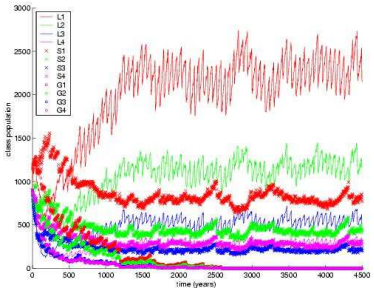
Suraphong Yuma

Research activities

- Observing cosmic rays by the Princess Sirindhorn Neutron Monitor at Doi Inthanon.
- Theory and computer simulations of the turbulent random walk of magnetic field lines in space plasmas,
- Precision modeling of observational data from abroad about particle injection near the Sun, interplanetary magnetic field, and particle transport in space.

- Measurement of light from stars and galaxies
- Actual astronomical observation of galaxies

Michael A Allen



Research activities

- solitons and nonlinear wave existence and stability
- solitary wave formation and interaction
- reaction-diffusion systems
- pattern formation
- fractals
- chaos
- ecosystems
- traffic
- free-surface fluid modelling

NONLINEAR SYSTEMS

Theoretical & Mathematical Physics

Udom Robkob

Sujint Suwanna

Research activities

- Quantum and classical field theory
- Quantum path integrals
- Anderson localization
- Non-equilibrium statistical physics

Atomic Optical Physics

Thaned Pruttivarasin

Research activities

- Instrumentation for physics
- Physics of Metrology
- Fundamental Atomic Physics
- Atomic Clocks