Faculty of Mathematics and Natural Sciences
Institut Teknologi Bandung

RESEARCH DIRECTORY






FMIPA 2014

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FMIPA 2014

FOREWORD

The Faculty of Mathematics and Natural Sciences started its evolution as a part of University Indonesia in Bandung in 1947. It finally became FMIPA (Fakultas Matematika dan Ilmu Pengetahuan Alam), as we currently know, with Institut Teknologi Bandung (ITB) charter in 1959. At the moment, FMIPA is one of the 13 faculties and schools in ITB. Its 183 permanent members are actively engaged in academic and research activities in the area of astronomy, chemistry, mathematics and physics; in basic areas of sciences, and their applications as well.

Research activities in FMIPA are carried out by its 15 research divisions, along its four traditional foundations; they are Astronomy, Chemistry cluster (Biochemistry, Analytical Chemistry, Inorganic and Physical Chemistry, and Organic Chemistry), Mathematics cluster (Algebra, Analysis and Geometry, Combinatorial Mathematics, Industrial and Financial Mathematics, and Statistics), and Physics cluster (Magnetism and Photonic Physics, Electronic Material Physics, Nuclear Physics and Biophysics, Physics of Earth and Complex Systems, and High Energy Physics and Instrumentation).

Based on the publication records of FMIPA faculty members, current trends and national priorities, the Senate of the FMIPA in 2010 declared four streams of research priorities, without leaving behind the basic research that has been the mainstay and the backbone of FMIPA all these years. The streams are

1. Renewable and innovative energy
2. Nano sciences and material
3. Instrumentation
4. Computational Sciences

In the year 2013, international collaboration on research and education, student and staff exchanges, as well as international accreditation were significantly strengthened as a part of internationalization programs of FMIPA.

This directory documents several aspects of research activities done by the faculty members of FMIPA ITB, and their output during the year 2013. In the coming years, FMIPA will continue to strive in pursuing its research agenda, in order to forge its reputation in national and international scenes, while making contributions to science, to humanity and to the fullfilment of Indonesia's national interests and needs.

Umar Fauzi, Dr.rer.nat, Prof.
Dean

CONTENTS



ASTRONOMY
RESEARCH DIVISION

ASTRONOMY
RESEARCH DIVISION

Ancient people have gazed at the stars, given them names, and observed their changes for thousands of years. Driven by discoveries, and enabled by leaps in technology and imagination, the way the universe is viewed has changed dramatically. More than a thousand planets have been discovered orbiting distant suns. Black holes are now known to be present at the center of most galaxies, including the Milky Way galaxy. The age, size and shape of the universe have been mapped based on the primordial radiation left by the Big Bang. And it has been learned that most of the matter in the universe is dark and invisible, and the universe is not only expanding, but accelerating in an unexpected way. Moreover the fields of astronomy and astrophysics are making new connections to physics, chemistry, biology, geology, electro & mechanical engineering and computer science, etc. Astronomy Research Division grows within these expanding multispectral dimension of broad and comprehensive basic space knowledge in a national and international play ground. Our goals are to understand the universe, to explore how the universe began, to learn the evolution of stars and galaxies, to study how planetary systems form and how atmosphere or environments hospitable for life exist or to seek the signature of life on Earth-like planets and to learn
the Sun and space weather.


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Members

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Grants

1. Dhani Herdiwijaya. Analisis Visibilitas Sabit Bulan Muda berdasarkan Nilai Kontras Terhadap Kecerlangan Langit dan Sistem Optik. *Desentralisasi Dikti 2013*.
2. Endang Soegiartini. A New tool for teaching Astronomy. *Program Pengabdian Kepada Masyarakat 2013*.
3. Taufiq Hidayat. *Program Riset dan Inovasi KK ITB 2013*.
4. Mahasena Putra. *Program Riset dan Inovasi KK ITB 2013*.

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4. E. I. Akbar, H. L. Malasan, M. Putra, A. Setiawan, M. Sulaeman, M. Irfan, M. Yusuf, G. K. Haans, Z.M. Arifin, I.P.W. Hadiputrawan, R. W. Aryawardhana, D. G. Ramadhan dan Sulistiyowati, Status Teleskop Bima Sakti di Observatorium Bosscha, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
5. M. Irfan, G. Akhiri, Purnomo, M. Putra, dan M, Yusuf, Status Perbaikan Sistem Kontrol Teleskop Goto 45 cm, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
6. A.Setiawan, M. Budiman, T. Hidayat, D. Herdiwijaya, P. Mahasena Putra, dan M. Yusuf, Callisto: Teleskop Radio Matahari di Observatorium Bosscha, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
7. T. Hidayat, P. Mahasena, B. Dermawan, D. Herdiwijaya, C. Kunjaya, Z. L. Dupe, B. Brahmantyo, P. W. Premadi, M. Yusuf, D. Mandey, H.R.T. Wulandari, A. Munir, A. T. Jaelani, D. H. Nugroho, F. Arief, A. B. Suksmono, M. Irfan, A. T. P. Jatmiko, E. I. Akbar, Y. Yulianty, Sulistyowati, H. L. Sianturi, J. L. Tanesib, dan A. Warsito, Current Status Testing Programs in West Timor for the Future Multi-Wavelength Observatory, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
8. T. Hidayat, A. Munir, B. Dermawan, A. T. Jaeni, A. B. Suksmono, F. Arief, and the Bosscha Site Testing Team, Radio Frequency Interference Measurement in Site Testing Programs for the Future Multi-wavelength Observatory in Indonesia, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
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10. M. Irfan, A. T. P. Jatmiko, D. G. Ramadhan, M. Yusuf, dan M. Putra, Pengukuran Kecerlangan Langit di Kecamatan Amfoang Tengah, Kabupaten Kupang Nusatenggara Timur, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
11. A.T. P. Jatmiko, M. Yusuf, M. Putra, T. Hidayat, D. Herdiwijaya, D. Mandey, E. I. Akbar, Y. Yulianty, M. Irfan, dan M. Raharto, Penggunaan Kamera CCD untuk Mendeteksi Bulan Sabit di Siang Hari, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha

12. D. Herdiwijaya, Kontras Bulan Sabit dengan panjang Gelombang Visual dan Infra Merah, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
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17. P. W. Premadi, Cosmological Copernican Principle, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
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19. M. Raharto, A Study of Circum-stellar Dust around M Stars, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
20. T. Dani & Dhani Herdiwijaya, Decliming Trends of Global Upper Atmosphesric Density during the 23" Solar Cycle, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
21. M.Z. Nurzaman dan D. Herdiwijaya, Simulasi Hidrodinamika 3-Dimensi Granulasi Matahari Menggunakan Program ZEUS-MP, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
22. Y. Yulianti, P. W. Premadi, dan M. Putra, Pengembangan Museum Astronomi di Observatorium Bosscha, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
23. R. P. Ayu, E. Soegiartini, H. L. Malasan, M. I. Arifyanto, dan R. Priyatikanto, Pembelajaran Astronomi Menggunakan Instrumen Kamera Web, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
24. W. Liliawati dan D. Herdiwijaya, Pembelajaran Terintegrasi Kecerdasan Majemuk untuk Membekalkan Konsep Bintang bagi Calon Guru SMP, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
25. Sulistyowati, P. W. Premadi, dan H. Setyanto, Rubu al-mujayyab sebagai Media Pembelajaran Siswa, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
26. F.M. Simatupang, Proses Publikasi Ilmiah dalam Jurnal Astronomi, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
27. D. Mandey, A. Dzikra, T. Hidayat, dan P. Mahasena, Pengamatan Eksoplanet dengan Metode Transit di Observatorum Bosscha, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
28. I.N. Huda dan B. Dermawan, Masalah 3-Benda Terbatas Planet-Eliptik: Kestabilan Trojan Eksoplanet, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
29. N.Ahmad dan D. Herdiwijaya, Analisis Korelasi Kasus Anomali Satelit Melalui Variasi Magnetik Bumi, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha
30. B. Dermawan, T. Hidayat, dan J. A. Utama Pengembangan Integrator Swift_rmvs4 dengan Melibatkan Efek Termal, *Seminar HAI*, 1-2 Oktober 2013 di Obs. Bosscha

ANALYTICAL CHEMISTRY
RESEARCH DIVISION

ANALYTICAL CHEMISTRY
RESEARCH DIVISION

Analytical chemistry is a scientific discipline which develops and applies methods, instruments and strategies to obtain information on the composition and nature of matter in space and time. Our focus is on the development, validation and application of state-of-the-art, integrated and automated analytical methods and instrumentation, for trace analysis and speciation.

The mission of the research group:

Provide leadership in analytical chemistry research and education at the highest international level capable to make positive impact on the world, as well as provide supporting environment for scientific growth of each group member. The supporting environment will be created by synergy among the individual group member, supervisor, laboratory managers, senior staff and other group members.


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Grants

1. Indra Noviandri, Pengembangan elektroda termodifikasi molecularly imprinted polymer (MIP) untuk analisis kafein secara langsung di lapangan. *Program Riset dan Inovasi KK ITB 2013.*
2. Muhammad Bachri Amran, Metal Ion Imprinted Polymers (MIIPs) untuk prakonsentrasi dan analisis renik ion logam berat berbasis flow injection analysis (FIA). *Program Riset dan Inovasi KK ITB 2013.*
3. Muhammad Ali Zulfikar, Molecular Imprinted Polymer sebagai material fungsional untuk penghilangan asam humus dari air gambut. *Program Riset dan Inovasi KK ITB 2013.*
4. Muhammad Ali Zulfikar, Peningkatan Kualitas dan Produksi Industri Garam Rakyat. *Program Pengabdian kepada Masyarakat, ITB 2013.*
5. Indra Noviandri, Kolorimeter dengan sensor Light Dependence Resistor untuk praktikum siswa SMA. *Program Pengabdian kepada Masyarakat, ITB 2013.*
6. Meyliana Wulandari, M.B. Amran, Curcumine Moleculary Imprinted Polymer, *Sandwich Program, Spain.*
7. Handajaya Rusli, M.B. Amran, Membrane Bioreactor, *Sandwich Program, Italy.*
8. Tiny A. Koesumawati, Buchari, Arsenic Speciation, *Sandwich Program, Polandia.*

Publication

1. Sri Widarti, Muhammad Bachri Amran, Zeily Nurrahman, Buchari, Toyohide Takeuchi, (2013), Novel material; non catalytic functioning of linear polystyrene with diaminopropane-β cylodextrin that will be used in α-amylase separation and purification. *International Journal of Engineering Research and Applications*, Vol. 3, Issue 1, January -February 2013, pp.2105-2109.

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5. Muhammad Ali. Zulfikar (2013), Effect of Temperature on Adsorption of Humic Acid from Peat Water onto Pyrophyllite. *International Journal of Chemical, Environmental & Biological Sciences (IJCEBS)*, **1(1)**, 88-90.
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7. M.A. Zulfikar, D. Wahyuningrum, and S. Lestari (2013), Adsorption of lignosulfonate compound from aqueous solution onto chitosan-silica beads. *Separation Science and Technology*, **48(9)**:1401-1411.
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9. Muhammad Ali Zulfikar and Henry Setiyanto (2013), Adsorption of Congo Red from aqueous solution using powdered eggshell. *International Journal of ChemTech Research*, **5(4)**, 1532-1540.
10. Reni Mulyani, Buchari, Indra Noviandri, and Ciptati (2013), Voltammetry Studies for the Electro-oxidation of CTAB using Pt/Co Electrode in the Supporting Electrolyte KOH. *IOSR Journal Of Environmental Science, Toxicology And Food Technology (IOSR-JESTFT)*, **3(1)**, 11-15.
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13. Muhammad Ali Zulfikar and Henry Setiyanto (2013) Adsorption of Humic Acid from Peat Water on Pyrophyllite. *International Journal of Chemical, Environmental & Biological Science* 1: 4. 714-717 October
14. A.Rohiman, Buchari, M.B. Amran, and E. Juliastuti., (2013), Modifikasi dan Aplikasi Serat Optik untuk Sensor Kimia pada Pertanian Hidroponik. *Prosiding Seminar Nasional Material 2013 (SNM 2013)*, ISBN: 978-602-19915-1-0, pp. 49 – 53
15. T. W. Manurung and M.B. Amran, (2013), Poli-Thiosalisilat sebagai Metal-Ion Imprinted Polymers untuk Ion Logam Pb(II), *1st Indonesian Student Conference on Science and Mathematics (2013).*
16. H. Hikmat and B. Buchari, (2013), Studi Potensiometrik Kawat Emas Berlapis Polipirol Sebagai Material Sensor Ion Fosfat, *1st Indonesian Student Conference on Science and Mathematics (2013).*
17. V. Yondi and A. Sulaeman, (2013), Penentuan nilai soot, oksidasi, nitrasi dan sulfasi dalam pelumas dengan FTIR-HATR, *1st Indonesian Student Conference on Science and Mathematics (2013).*
18. R. Resdiana and A. Sulaeman, (2013), Adsorpsi Logam Zn dan Cd dalam Larutan Menggunakan Karboksimetil Glukomanan. *1st Indonesian Student Conference on Science and Mathematics (2013).*
19. D. Nurliasari and A. Sulaeman, (2013), Optimasi dan Karakterisasi Pati Glukomanan sebagai Penyalut pada Buah Stroberi (Fragaria x annasa). *1st Indonesian Student Conference on Science and Mathematics (2013).*

20. T. A. Koesmawati, B. Buchari, and A. Sulaeman, (2013), Sample preparation method for organic arsenic species (arsenobetain) in tuna fish sample followed by HG-QFAAS measurements. *1st Indonesian Student Conference on Science and Mathematics (2013).*
21. A. D. Ritonga and A. Sulaeman, (2013), Isolation and Characterization Glucomannan from Different Types of Talas (Colocasia) and Iles-iles (Amosphophalus oncophyllus). *1st Indonesian Student Conference on Science and Mathematics (2013).*
22. C. Angelika and I. Noviandri, (2013), Elektroda Pasta Karbon Termodifikasi Molecularly Imprinted Poly(3-aminophenol) untuk Analisis Kafein Secara Voltametri. *1st Indonesian Student Conference on Science and Mathematics (2013).*
23. M. Michelle and I. Noviandri, (2013), Carbon Paste Electrode Modified With Molecularly Imprinted Poliaminofenol Analysis For Paracetamol Voltammetri. *1st Indonesian Student Conference on Science and Mathematics (2013).*
24. R. Fauzia and I. Noviandri, (2013), Kinerja dari Beberapa Elektroda Pasta Karbon yang Dimodifikasi dengan Poly-Eriochrome Black-T untuk Penentuan Dopamin secara Voltammetri. *1st Indonesian Student Conference on Science and Mathematics (2013).*

BIOCHEMISTRY
RESEARCH DIVISION

BIOCHEMISTRY
RESEARCH DIVISION

Biochemistry Research Group is a group of researchers and lecturers in bioscience to understand life at the molecular level, which includes the structure and interaction of atoms/molecules, the mechanism of enzyme catalyst reactions, metabolism and energetics, and genetic information.
The current research is molecular biology thermophilic microorganism and biochemistry of DNA polymerase and thermostable lipases; studies of clinical isolates of *Mycobacterium tuberculosis* resistant to anti-tuberculosis drugs; biochemical and bioprocess of enzymes acting on carbohydrates, such as family of amylase, cellulase, and chitinase; biodiesel production from micro and macro algae, as well as simulations of molecular dynamics to study protein folding and its stability.
The vision of research group is to be a leading research group in the field of biochemistry and molecular biology; The mission is to undertake education and research which contribute to the understanding of bioscience and to the improvement of human welfare, in particular Indonesian society.


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11.	Zeily Nurachman	Dr. (Tokyo Institute of Technology) zeily@chem.itb.ac.id

Grants

1. Ihsanawati. Kloning dan Ekspresi Gen Pengkode Kitosanase dalam rangka Produksi Kitooligisakarida Untuk Keperluan Medis. *Desentralisasi Dikti 2013*.
2. Santi Nurbaiti. Enkapsulasi Lipase dalam Reaktor Nano untuk Konversi Minyak Sawit menjadi Biodiesel. *Desentralisasi Dikti 2013*.
3. Dessy Natalia. Produksi Protein Rekombinan NS1 pada ragi Pichia Pastoris untuk Pengembangan Kit Diagnostik Virus Dengue. *Penelitian Unggulan Strategis Nasional 2013*.
4. Made Puspasari Widhiastuty. *Program Peningkatan Kapasitas 2013*.
5. Santi Nurbaiti. *Program Riset dan Inovasi KK ITB 2013*.

Publication

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2. Megga Ratnasari Pikoli, Pingkan Aditiawati, Dea indriati Astuti, Akhmaloka , Bacterial diversity in subbituminous coal and soil from coal mine of South Sumatra. *Indonesia International Journal of Integrative Biology*, **14(2**). 2013.
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4. Megga Ratnasari Pikoli, Pingkan Aditiawati, Dea indriati Astuti, Akhmaloka, DNA Extraction of Mixed Culture Bacteria from Coal-Soil Mixture Cultured by Sequential Enrichment. *Journal of Pure and Applied Microbiology*, **7(3)** : 1743 - 1748. 2013.
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ORGANIC CHEMISTRY
RESEARCH DIVISION

ORGANIC CHEMISTRY
RESEARCH DIVISION

Organic Chemistry Research Group of the Faculty of Mathematics and Natural Sciences has a vision: to be the Indonesia's leading research groups in chemistry, with an international reputation for academic excellence and achievement. Its missions are: to study and develop organic chemistry with many related aspects focused on acquiring biodiversity for broadening molecular diversity regarding chemical and biological potential to the human race, as well as on developing organic synthesis to develop techniques and its applications on material science and bioscience.


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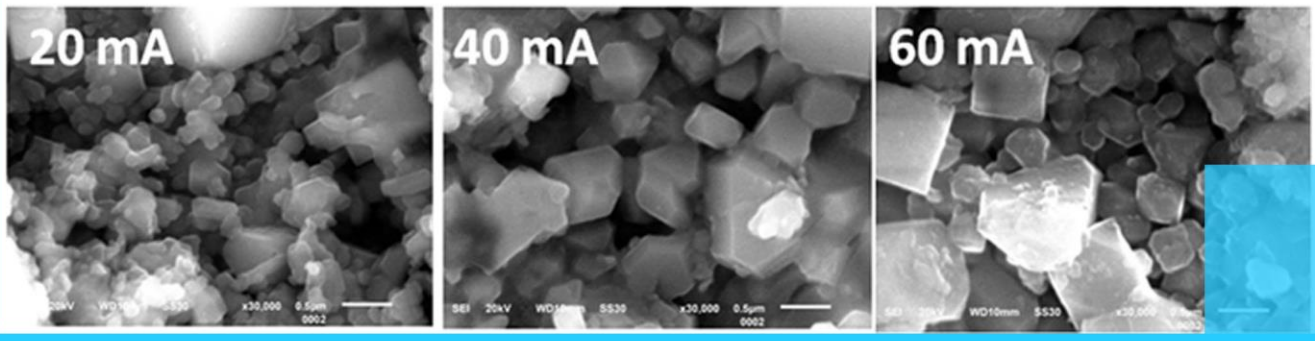
Grants

1. Euis Holisotan Hakim. Penyelidikan Preniltransferase, Enzim Pemeran Kunci pada Biosintesis Senyawa Bioaktif pada Tumbuhan Murbei (Moraceae). *Desentralisasi Dikti 2013*.
2. Euis Holisotan Hakim. Evaluasi Kimia Dan Bioaktivitas Metabolit Sekunder Dari Kultur Akar Rambut Andalas (Morus Macroura). *Riset dan Inovasi ITB*
3. Ciptati. Sintesis Skala Besar Tetramino_Porfirin dengan Metoda Microwave-Assisted Organic Synthesis (MAOS) sebagai Bahan Aktif Sel Surya Organik, *Program Peningkatan Kapasitas 2013*.
4. Deana Wahyuningrum. Pengembangan Perangkat Lunak untuk Penentuan Efisiensi Inhibisi Inhibitor Korosi Organik dalam aplikasinya di Pertambangan, Perminyakan dan Gas Bumi. *Riset KK – ITB 2013*.
5. Didin Mujahidin. Peningkatan Nilai Tambah Produk Petrokimia C4 sebagai Bahan Peningkat Bilangan Oktan Bahan Bakar Bensin melalui Sintesis ETBE. *Insentif Riset Sinas 2013*
6. Lia Dewi Juliawaty. Pencarian Obat untuk Penyakit Alzheimer dari Agathis dammara (Araucariaceae). *Desentralisasi Dikti 2013*.
7. Yana Maolana Syah. Kajian Sifat Anti Mikroba dari Komponen Kimia Phyllanthus myrtifolius. *Desentralisasi Dikti 2013*.
8. Yana Maolana Syah. Fitokimia dan sifat sitotoksik senyawa-senyawa turunan fenol dari tumbuhan Macaranga andenoceras. *Riset KK – ITB*

Publication

1. Shiozaki, T., Fukai, M., Hermawati, E., Juliawaty, L.D., Syah, Y.M., Hakim, E.H., Puthongking, P., Suzuki, T., Kinoshita, K., Takahashi, K., Koyama, K. Anti-angiogenic effect of α-mangostin. *Journal of Natural Medicines*, **67 (1)**, 202-206 (2013)
2. Puspasari, F., Radjasa, O.K., Noer, A.S., Nurachman, Z., Syah, Y.M., van der Maarel, M., Dijkhuizen, L., Janeček, S., Natalia, D. Raw starch-degrading α-amylase from Bacillus aquimaris MKSC 6.2: Isolation and expression of the gene, bioinformatics and biochemical characterization of the recombinant enzyme, *Journal of Applied Microbiology*, **114 (1)**, 108-120 (2013).

3. Kamarozaman, A.S., Latip, J., Syah, Y.M., Rajab, N., Jaloh, A. Oligostilbenoids from Vatica pauciflora and the oxidative effect on chang cells. *Journal of Physics: Conference Series*, **423 (1)**, art. no. 012045 (2013).
4. Ferlinahayati, Syah, Y.M., Juliawaty, L.D., Hakim, E.H. Flavanones from the wood of Morus nigra with cytotoxic activity. *Indonesian Journal of Chemistry*, **13 (3)**, pp. 205-208 (2013)
5. Muhammad Ali Zulfikar, Deana Wahyuningrum, dan Shinta Lestari). Adsorption of Lignosulfonate Compound from Aqueous Solution onto Chitosan-Silica Beads. *Separation Science and Technology* **48**: 1391–1401 (2013).



INORGANIC AND PHYSICAL CHEMISTRY

RESEARCH DIVISION

INORGANIC AND PHYSICAL CHEMISTRY

RESEARCH DIVISION

Inorganic and Physical Chemistry Research Group accommodates several academic staffs of inorganic and physical chemistry, who have various research interests: coordination compounds, metal oxides, catalysts, ceramic, biodegradable polymer, biopolymer, membrane, composite, corrosion and computational and theoretical chemistry. We are responsible for delivering the teaching of inorganic and physical chemistry for undergraduate and graduate studies in ITB.

The mission of the research group:

1. to perform the teaching of inorganic and physical chemistry,
2. to make continuous improvement of teaching and learning of inorganic and physical chemistry,
3. to carry out research in the new materials and to align the various research topics in the group (coordination compounds, metal oxides, catalysts, ceramic, biodegradable polymer, biopolymer, membrane, composite, corrosion and computational and theoretical chemistry),
4. to enhance collaborations with various research groups (domestic and overseas).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Grants

1. Rino Rakhmata Mukti. Towards an Economic, Simple and Environmentally-Friendly Synthesis of Zeolite in The Absence of Organic Template. *Desentralisasi Dikti 2013*.
2. Veinardi Suendo. Sintesis Tanpa Pelarut Ligan Tetraphenylporphyrin dan Senyawa Kompleksnya dengan berbagai Logam Blok-D dengan bantuan Radiasi Microwave sebagai Light Harvesting Agent pada Aplikasi Sel Surya. *Desentralisasi Dikti 2013*.
3. Yessi Permana. Poliester Menggunakan Gas Sintetik Batubara. *Desentralisasi Dikti 2013*.
4. I Made Arcana. Pembuatan Membran Polimer Elektrolit dari Poli(Vinil-Alkohol) untuk Aplikasi Baterai Litium. *Desentralisasi Dikti 2013*.
5. Ismunandar. Intermediate Temperature Solid Oxide Fuel Cell: Uji Kinerja Sel Tunggal Berelektrolit Cerid Terdoping Ganda. *Desentralisasi Dikti 2013*.
6. Ismunandar. ITB Mengajar Sekitar. *Program Pengabdian Kepada Masyarakat 2013*.
7. I Made Arcana. Pengembangan Membran Polimer Elektrolit untuk Aplikasi Baterai Lithium. *Insentif Riset Sinas 2013*.
8. Ismunandar. Single Cell Test Using Codoped Ceria as Electrolyte. *Riset Asahi Glass Foundation 2013*.
9. Veinardi Suendo. Synthesis of Tetramino-Porphyrin/Polyaniline Complex as Optic Active Layer in Organic Optoelectronic Applications. *Riset Asahi Glass Foundation 2013*.
10. Bambang Prijamboedi. *Program Riset dan Inovasi KK ITB 2013*.
11. Bunbun Bundjali. *Program Riset dan Inovasi KK ITB 2013*.
12. Veinardi Suendo. *Program Riset dan Inovasi KK ITB 2013*.
13. Yessi Permana. *Program Riset dan Inovasi KK ITB 2013*.
14. I Made Arcana. *Program Riset dan Inovasi KK ITB 2013*.
15. Ismunandar. *Program Riset dan Inovasi KK ITB 2013*.
16. Cynthia Linaya. *Program Riset dan Inovasi KK ITB 2013*.
17. Rino Rakhmata Mukti. *Program Riset dan Inovasi KK ITB 2013*.

Publication

1. Yessi Permana, Ring-Opening of Oxiranes using Taeniolite-Supported Tris (ß-Diketonato) Zirconium, *ITB Journal of Science*. 2013.
2. Veinardi Suendo, Effect of Electrochemical Reaction Environment on the Surface Morphology and Photoluminescence of Porous Silicon, *Materials Science Forum*. 2013.
3. I Made Arcana, Properties of Polymer Electrolyte Membranes Prepared by Blending of Sulfonated Polystyrene-lignosulfonate, *ITB Journal of Science*. 2013.
4. Iqbal Fauzi, Deana Wahyuningrum, I Made Arcana, The Effect of Succinyl Gruops and Lithium Perchlorate on Chitosan Membrane Properties as Solid Polymer Electrolyte, *The International Conference and Exhibition on Innovation in Polymer Science and Technology in conjunction with the 4th International Conference on Fuel Cell and Hydrogen Technology 2013 (ICFCHT2013) (IPST- ICFCHT2013)*, Yogyakarta, Indonesia, October 7 – 10. 2013.
5. Iqbal Fauzi, Deana Wahyuningrum, I Made Arcana, Synthesis and Characterization of Solid Polymer Electrolyte from N-Succinyl Chitosan and Lithium Perchlorate, *The International Conference on Advanced Materials Science and Technology (ICAMST 2013)*, Yogyakarta, Indonesia, September 17-18. 2013.
6. I Made Arcana, Achmad Rochliadi, Bunbun Bundjali, Hariyawati Dharmi, Preparation of Polymers Electrolyte Membranes from Styrofoam Waste for Lithium Battery, *Joint International Conference on Rural Information and Communication Technology and Electric*, Denpasar, Bali, November 26-27. 2013.
7. Achmad Rochliadi, I Made Arcana, Bunbun Bundjali, Multazam, Energy Return Factor Analysis of Lithium Battery of Lithium Battery During Charge/Discharge Cycle, *Joint International Conference on*

Rural Information and Communication Technology and Electric, Denpasar, Bali, November 26-27. 2013.Achmad R

8. ochliadi, I Made Arcana, Bunbun Bundjali, Multazam, During Charge/Discharge Cycle, *Vehicle Technology*, November 26-27. 2013.
9. Desnelli, D. Mujahidin, Y. Permana, C. L. Radiman, Copolymerization of Acrylamide with 9– and 10-Acrylamidodecanoic Acid, *International Conference and Exhibition on Innovation in Polymer Science and Technology 2013 (IPST2013) in conjunction with The 4th International Conference on Fuel Cell and Hydrogen Technology 2013 (ICFCHT2013)* , 7-9 Oktober 2013, Yogyakarta. 2013.
10. H.F. Aritonang, D. Onggo, Ciptati, C.L. Radiman, Insertion of Platinum Particles in Bacterial Cellulose Membranes from PtCl4 and H2PtCl6 Precursors, *International Conference and Exhibition on Innovation in Polymer Science and Technology 2013 (IPST2013) in conjunction with The 4th International Conference on Fuel Cell and Hydrogen Technology 2013 (ICFCHT2013)* , 7-9 Oktober 2013, Yogyakarta. 2013.
11. M. G. Darmayanti, C. L. Radiman, Synthesis and Characterization of kappa-Carrageenan-graft-acrylamide for Enhanced Oil Recovery Application, *International Conference and Exhibition on Innovation in Polymer Science and Technology 2013 (IPST2013) in conjunction with The 4th International Conference on Fuel Cell and Hydrogen Technology 2013 (ICFCHT2013)* , 7-9 Oktober 2013, Yogyakarta. 2013.
12. C. L. Radiman, A. Sarinastiti, Cellulosic materials as polymer electrolyte membrane in fuel cell applications, *Jurnal Selulosa*. 2013.
13. C. L. Radiman, A. Rifathin, Preparation of phosphorylated nata-de-coco for polymer electrolyte membrane applications, *Journal of Applied Polymer Science*. 2013.
14. Rino Rakhmata Mukti, Sulfonic acid functionalized MCM-41 as solid acid catalyst for tert-butylation of hydroquinone enhanced by microwave heating, *Applied Catalysis A: General*. 2013.
15. Rino Rakhmata Mukti, Formation of Hierarchically Organized Zeolites by Sequential Intergrowth, *Angewandte Chemie*. 2013.
16. Rino Rakhmata Mukti, Eco-friendly synthesis for MCM-41 nanoporous materials using the non-reacted reagents in mother liquor, *Nanoscale Research Letters*. 2013.
17. Rino Rakhmata Mukti, Role of 3-aminopropyltriethoxysilane in the preparation of mesoporous silica nanoparticles for ibuprofen delivery: Effect on physicochemical properties, *Microporous and Mesoporous Materials*. 2013.
18. Rino Rakhmata Mukti, Ionothermal approach for synthesizing AlPO-5 with hexagonal thin-plate morphology influenced by various parameters at ambient pressure, *Solid State Sciences*. 2013.
19. R. Rachmawati, A. J. J. Woortman, K. Loos, Facile preparation method for inclusion complexes between amylose and polytetrahydrofurans, *Biomacromolecules*. 2013.
20. R. Rachmawati, A. J. J. Woortman, K. Loos, Tunable Properties of Inclusion Complexes between Amylose and Polytetrahydrofuran, *Macromolecular Bioscience*. 2013.
21. R. Rachmawati, A. J. J. Woortman, K. Loos, Solvent-Responsive Behavior of Inclusion Complexes between Amylose and Polytetrahydrofuran, *Macromolecular Bioscience*. 2013.
22. Veinardi Suendo, Effect of Electrochemical Reaction Environment on the Surface Morphology and Photoluminescence of Porous Silicon, *Materials Science Forum*. 2013.
23. Veinardi Suendo, Influences of Dopant Concentration in Sol-Gel Derived AZO layer on The Performance of P3HT: PCBM Based Inverted Solar Cell, *Solar Energy Materials & Solar Cells*. 2013.
24. Veinardi Suendo, Investigation of Silicon Heterojunction Solar Cells by Photoluminescence under DC Bias, *European Physical Journal: Photovoltaic*. 2013.
25. D Onggo, O.K Putri and M Amonah, Utilization of nata de coco as a matrix for preparation of thin film containing spin crossover iron(II) complexes, *Proceedings of the 15th SPVM National Physic Conference, 2013 International Conference in Applied Physics and Material Science, 2013 Intrenational Scientific Meeting on Complex Systems*. 2013.

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27. Mukti, R. R., Wustoni, S., Wahyudi, A., & Ismunandar. (2013). Conversion of the low quality Indonesian naturally-occurring minerals into selective type of zeolites by seed-assisted synthesis method. *Indonesian Journal of Chemistry,* **13(3)**, 278-282.
28. Syarif, D. G., Soepriyanto, S., Ismunandar, & Korda, A. A. (2013). Effect of LSGM addition on electrical characteristics of 8ysz ceramics for solid electrolyte. *Journal of the Australian Ceramic Society,* **49(2)**, 52-59.





ALGEBRA
RESEARCH DIVISION

ALGEBRA
RESEARCH DIVISION

Algebra is a branch of mathematics concerning the study of structure, relation and quantity. Elementary (highschool) Algebra provides an introduction to the basic ideas of algebra, including effects of adding and multiplying numbers, the concept of variables, definition of polynomials. Algebra is much broader, algebra covers working with symbols, variables and set elements. Addition and multiplication are viewed as general operations, and their precise definitions lead to structures such as groups, rings and fields.

The research program of Algebra Research Division ITB covers the fundamental research with emphasis on the development of the theory of module with categorical approach, and the applied research with emphasis on the application of algebraic structures in control system, cryptography, coding theory and other areas.

Workshop on Teaching Algebra and Workshop on Research in Algebra are organized and held annually in alternating since 2011. Algebra Research Seminar is held weekly, as an opportunity to exchange ideas between young algebristes.


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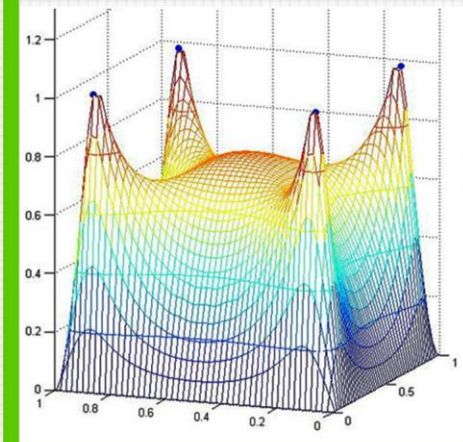
Grants

1. STIC-Asie Project (sciences et technologies de l'information et de la communication), financed by the French Ministry of Foreign Affairs and linking LAMFA (France), ITB and UGM (Indonesia), Beijing Normal University and East China Normal University (China).
2. Dr. Intan Muchtadi, Fajar Yuliawan, M.Si, Dr. Budi Rahardjo (STEI). Percepatan Parallelized Pollard Rho untuk Identifikasi Kelas Lemah Kurva Eliptik. *Asahi Glass Foundation Juli 2012- Juli 2013*.
3. Dr. Intan Muchtadi, Prof. Dr. Irawati, Dr. Hanni Garminia. Generalization of Dedekind Prime Rings and HNP Rings. *Riset dan Inovasi KK 2013*.
4. Dr. Hanni Garminia dan Prof. Dr. Irawati. Spektrum dari Hypermatriks Ketetanggaan dari Kelas Hypergraph General k-partite. *Riset dan Inovasi KK 2013*.
5. Prof. Dr. Pudji Astuti dan Dr. Hanni Garminia. Karakterisasi Modul Dual dari Modul Deret Laurent Terpotong atas Gelanggang Rasional Murni. *Riset dan Inovasi KK 2013*.
6. Dr. Aleams Barra, Dr. Ahmad Muchlis, dan Dr. Intan Muchtadi. Pengembangan Basis Normal untuk Teori Koding atas Gelanggang Hingga. *Riset dan Inovasi KK 2013*.

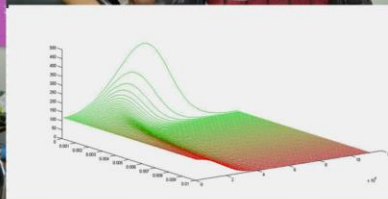
Publication

1. Faisal, Irawati, I. Muchtadi-Alamsyah, Auslander-Reiten Quiver of Nakayama Algebra type Dynkin Graph An, *Journal of Mathematical and Fundamental Sciences*, **Vol 45 No.1**, 1-16, 2013
2. I. Muchtadi-Alamsyah and F. Yuliawan, Basis Conversion in Composite Fields, *International Journal of Mathematics and Computations*, **Vol 19 Issue 2**, 11-17, 2013

3. M. A. Misri, Irawati and H. Garminia, Generalization of Bezout Modules, *Far East Journal of Mathematical Sciences* **Vol 72 Issue 1**, 131-133, 2013
4. S. Sylviani, H. Garminia, P. Astuti, Behavior for time invariant finite dimensional discrete linear systems, *Journal of Mathematical and Fundamental Sciences* **Vol 45 No 1**, 38-52, 2013.
5. P. Astuti, Riesz representation theorem on generalized n-inner product spaces, *International Journal on Mathematical Analysis*, **Volume 7 Issue 17-20**, 873-882, 2013.
6. P. Astuti, H.K. Wimmer, Characteristic and hyperinvariant subspaces over the field GF(2), *Linear Algebra and Its Applications*, **Volume 438 Issue 4**, 1551-1563, 2013.
7. Darmajid, I. Muchtadi-Alamsyah, Open Condition on Variety of Complexes, *East West Journal of Mathematics* **Vol 15 No 1**, 37-42, 2013
8. H. Marubayashi, I. Muchtadi-Alamsyah, A. Ueda, Skew polynomial rings which are generalized Asano prime rings, *Journal of Algebra and Its Applications*, **Vol 12 Issue 7**, 2013
9. I. Muchtadi-Alamsyah, T. Ardiansyah, S.S. Carita, Pollard Rho Algorithm for Elliptic Curves over GF(2n) with Negation Map, Frobenius Map and Normal Basis, *Far East Journal of Mathematical Sciences*, **Special Volume Issue IV**, 385-402, 2013
10. Faisal and I. Muchtadi-Alamsyah, On Cyclic Nakayama m-Cluster Tilted Algebras of Type An, *Proceeding International Conference on Mathematical Research, Education and Applications*, *Ho Chi Minh City*, 119-127, 2013.
11. E. Suwastika and I. Muchtadi-Alamsyah, *Generalized Dedekind Modules, Proceeding 3rd Basic Science International Conference 2013, Brawijaya University*, 2013.
12. Faisal, Irawati, I. Muchtadi-Alamsyah, Auslander-Reiten Quiver of Nakayama Algebra Nn-2,n, *Jurnal Matematika dan Sains* **Vol 18 No 1**, 11-17, 2013







ANALYSIS AND GEOMETRY
RESEARCH DIVISION

ANALYSIS AND GEOMETRY
RESEARCH DIVISION

Mathematical Analysis can sometimes be described as studies of spaces of mathematical objects based on the notion of "nearness", or metric in particular. More popularly, it includes theory of Calculus (limit, differentiation, integration, measure) and its generalization.
At ITB, Analysis & Geometry Research Division put emphasis towards the applied side of Mathematical Analysis, without leaving the fundamentals behind. Some recent research includes analysis in n-normed spaces, fractional integral operators, analysis in seismic, energy in diffusive equations, impulsive delay equations, Hamiltonian systems.
Thematic workshop WIDE (Workshop on Integral and Differential Equations) and undergraduate student math competition MagD (Mathematical Analysis and Geometry Problem Solving Day) are organized and held annually by the Analysis & Geometry Research Division since 2006. It has since attracted participants nationally.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Grants

1. Yudi Soeharyadi. *Program Riset dan Inovasi KK ITB 2013*.
2. Hendra Gunawan. *Program Riset dan Inovasi KK ITB 2013*.

Publication

1. H. Tanaka, H. Gunawan. The local trace inequality for potential type integral operators. *POTA,* **38 : 2**. 2013.
2. D.I. Hakim, H. Gunawan. Weak (p,q) inequalities for fractional integral operators on generalized non-homogeneous Morrey spaces. *Math.* **Aeterna3 : 3**. 2013.
3. H. Batkunde, H. Gunawan, Y.E.P. Pangalela. Bounded linear functionals on the n-normed space of p-summable sequences. *AUMB Series Mathematics*, **71-80**. 2013.
4. S. Ekariani, H. Gunawan, M. Idris. A contractive mapping theorem for the n-normed space of p-summable sequences. *JMA* **4 : 1**. 2013.
5. R.A. Wibawa-Kusumah, H. Gunawan. Two equivalent n-norms on the space of p-summable sequence. *Per. Mat. Hungar.* **67 : 1**. 2013.
6. T.R. Kristianto, R.A. Wibawa-Kusumah, H. Gunawan. Equivalence relations of n-norms on a vector space. *Math.* **Vesnik65 : 4**. 2013.
7. M. Idris, S. Ekariani, H. Gunawan. On the space of p-summable sequences. *Math.* **Vesnik65 : 1**. 2013.
8. H. Gunawan, I. Sihwaningrum. Multilinear maximal functions and fractional integrals on generalized Morrey spaces. *J. Math. Analysis*, **4 : 3**, pp 23-32. 2013.
9. Eridani, H. Gunawan, E. Nakai, Y. Sawano. Characterizations for the generalized fractional integral operators on Morrey spaces. Math. Inequal. Appl. 2013.
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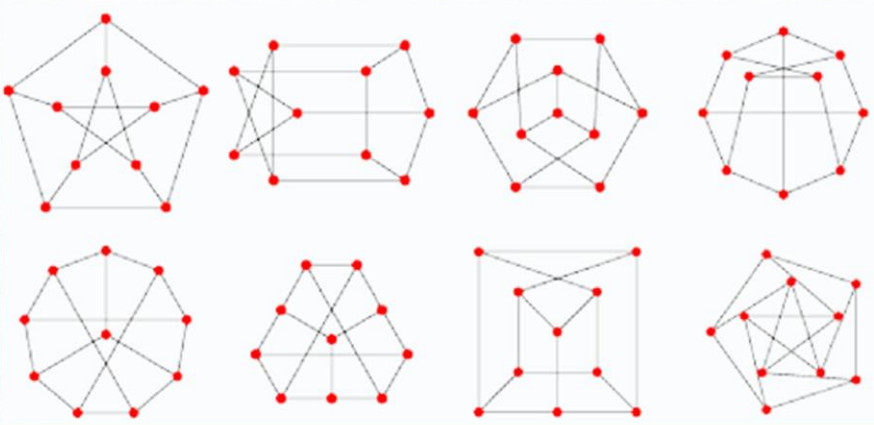

COMBINATORIAL MATHEMATICS

RESEARCH DIVISION

COMBINATORIAL MATHEMATICS
RESEARCH DIVISION

We envision to be one of leading research divisions for combinatorics and graph theory in South East Asia region. We conduct researches on the cutting-edge problems in combinatorics and graph theory and carry out the implementation to various applied (real-world) problems. Promoting the use and the importance of mathematics in today's life is also our mission.
Our research focus on (1) graph extremal problems: degree/diameter problems in di(graphs) and Ramsey theory and its generalizations/variations, (2) various aspects of graph labelings and colorings, (3) distance-related concepts in graphs, (4) combinatorial designs and association schemes, (5) random graphs, (6) coding & cryptography, and (7) combinatorial applications in real-world problems or other fields. We actively conduct prestigous international conferences and workshops, such as IWOCA 2001, IJCCGGT 2003, IWOGL 2004, ICGTIS 2007, CIMPA School 2009, and IWONT 2012. Graph Masters Workshop, an annual informal forum, has been regularly conducted since 2010. We have active and productive collaborations with the University of Newcastle Australia, Tohoku University Japan, Abdus Salam School of Mathematical Sciences GC University Pakistan, University of Twente Netherlands, Technical University of Kosice Slovakia, University of West Bohemia Czech Republic, and Polytechnic University of Catalonia Spain. Recently, we initiated the establishment of the Electronic Journal of Graph Theory and Applications (EJGTA).


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Grant

1. Djoko Suprijanto. Konstruksi Kode swa-dual MDS atau near-MDS atas ring hingga. *Desentralisasi Dikti 2013*.
2. Saladin Uttunggadewa. Dimensi Metrik dari Graf Hasil Amalgamasi. *Desentralisasi Dikti 2013*.
3. M. Salman A.N.. Optimasi Topologi Jaringan Komputer Berbasis Operasi Korona Bertingkat dengan menggunakan Pewarnaan-F. *Desentralisasi Dikti 2013*.
4. Rinovia Mery G. Simanjuntak. Pelabelan Ajaib Berdasarkan Jarak. *Penelitian Hibah Kompetensi 2013*.
5. Edy Tri Baskoro. Characterizing and Finding All Graphs with Certain Dimensions. *Penelitian Kerjasama Luar Negeri dan Publikasi Internasional 2013*.
6. Rinovia Mery Garnierita. *Program Riset dan Inovasi KK ITB 2013*.
7. M. Salman A.N. *Program Riset dan Inovasi KK ITB 2013*.
8. Edy Tri Baskoro. *Program Riset dan Inovasi KK ITB 2013*.
9. Suhadi Wido Saputro. *Program Peningkatan Kapasitas 2013*.
10. Djoko Suprijanto. *Program Riset dan Inovasi KK ITB 2013*.

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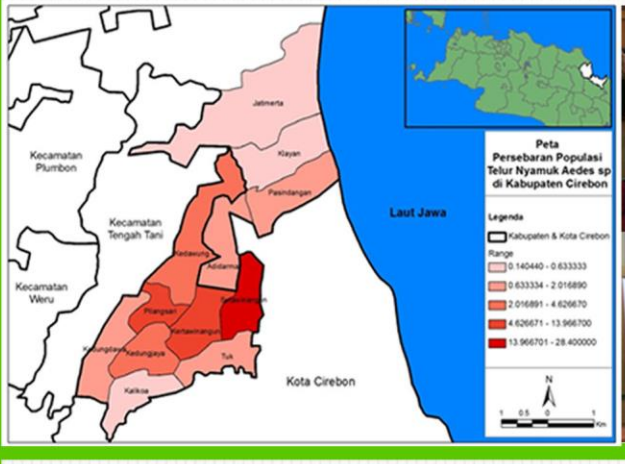


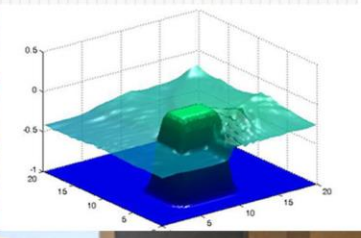


INDUSTRIAL AND FINANCIAL MATHEMATICS

RESEARCH DIVISION

INDUSTRIAL AND FINANCIAL MATHEMATICS
RESEARCH DIVISION

We focus on mathematical modeling and simulation of problems that are arisen not only from mathematics itself, but also from industry. We develop an active and strong network between mathematicians and users of mathematics in solving real problems through mathematical modeling. We provide mathematical and numerical courses on finance, optimization and control theory, fluid dynamics, and mathematical biology that are offered to any graduate and undergraduate students of ITB. Workshops related to certain topics in applied mathematics and industrial problems through IMW (Industrial Mathematics Week) are held regularly. We are actively involved in developing interdisciplinary networks between mathematician and other professionals or scientists in solving real-world problems using mathematical modeling. Several linkages have been developed for many years with our partner institutions. For instance, the group has collaborated intensively with Research Consortia OPPINET (Optimization on Oil & Gas Pipeline Network) and FinanMOS (Financial Modeling, Optimization, and Simulation). Both research consortia are conducted by PPMS (Center for Mathematicsal Modeling and Simulation) ITB.


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16. Dila Puspita	M.Si. (ITB) *Financial Mathematics* dila.puspita@math.itb.ac.id

Grants

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2. L. Hari Wiryanto. Pembentukan Gelombang diatas Media Berpori. *Desentralisasi Dikti 2013*.
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10. Kuntjoro Adji Sidarto. *Program Riset dan Inovasi KK ITB 2013*.
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16. Agus Yodi Gunawan. *Program Riset dan Inovasi KK ITB 2013*.

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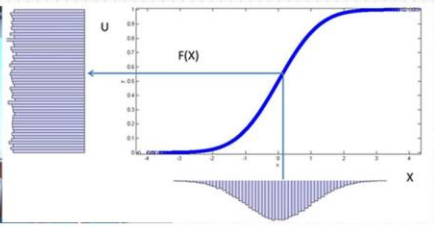

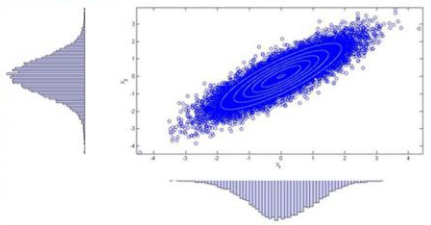

STATISTICS
RESEARCH DIVISION

STATISTICS
RESEARCH DIVISION

Statistical Analysis can be described as a study of sample spaces which is based on either field or σ-algebra. The determination of probability measure is constructed by a certain field or σ-algebra. At ITB, Statistics Research Division put emphasis towards the applied side of Probability Theory and Mathematical-Statistics. Some recent research include topics in space-time analysis, copula, hidden-Markov models, financial time series, reliability process, statistical process control, statistical inverse problems, general insurance, bio-informatics, geo-statistics, warranty. In the past and at present, some members of the Statistics Research Division had and have (research) collaborations with The Insurance Bureau, Indonesia Ministry of Finance; financial institutions and insurance industries. The Statistics Research Division also conduct workshops, including training for (statistics) laboratory assistants in order to improve their knowledge and skill in Data Analysis. Two workshops on Data Analysis (WDA) and Dependency Variables (WDV) will be held annually in the future. Another future program is Undergraduate Student Statistics Competition (USSC).


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Grants

Sapto Wahyu Indratno. *Program Riset dan Inovasi KK ITB 2013*.

Publications

1. Pasaribu U.S., Husniah H., and Iskandar B. P. Maintenance Service Contract Considering Imperfect Maintenance and Availability Target, *Prosiding: Conference on Control, Systems & Industrial Informatics 2nd Bandung*,2013, pp 177-182
2. Iskandar B.P., Husniah H., and Pasaribu U.S., Maintenance Service Contracts for Equipment Sold with Two Dimensional Warranties, *Jurnal Quality Technology and Quantitative Management (QTQM)(special issue on "Quantitative Evaluation in Reliability and Maintenance"*
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4. Vantika S, Pasaribu U.S., Estimation of Transition Matrix in Hidden Markov Model on Human Mitochondrial DNA Mutation, *Prosiding: International Conference on Mathematics & Statistics*, Penang 2013
5. Setiyowati, S., Pasaribu U.S., Mukhaiyar, U., Non-Stationary Model for Rice Price in Bandung, Indonesia, *Proseeding : 3rd International Conference on. Instrumentation Control and Automation*
6. Husniah H., Pasaribu U. S. and Iskandar B.P., A Servicing Strategy Involving Imperfect Repair for Two-Dimensional Warranties, *Prosiding : 3rd International Conference on. Instrumentation Control and Automation*

7. Iskandar B.P. , Pasaribu U. S. and Husniah H., Performanced Based Two Maintenance Contracts for Equipment Sold with Two Dimensional Warranties, *Proceedings: CIE43, The University of Hongkong*
8. Husniah H., Pasaribu U. S. and Iskandar B.P., A Servicing Strategy Involving Preventive Maintenance and Imperfect Repair for Two Dimensional Warranties, *Proceedings: CIE43, The University of Hongkong*
9. Indratno, S.W., Maldonado, D. and Silwal, S., On the Axiomatic approach to Harnack's inequality in doubling quasi-metric spaces, *J. Differential Equations*, 254(2013) 3369-3394.
10. Anisah dan S.W. Indratno, Plug-In Classifier Dengan Bayesian Statistics Untuk Mendeteksi Situs Web Palsu, *Prosiding Seminar Nasional Statistika*, Universitas Dipenogoro 2013 , ISBN:978-602-14387-0-1
11. Baiq Rika dan S.W. Indratno Ketaksamaan harnack dalam konteks graf, *Konfererensi Nasional Matematika ke XVI*, UNPAD
12. S.W. Indratno, D. Maldonado and S. Silwal, A visual formalism for weights satisfying reverse inequalities, preprint
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14. Y. Syukriyah, N. Nuraini, and S. W. Indratno, Dynamic Transmission Parameter Estimation in SIR model using regularized system of linear equations preprint *(aip proceeding)*
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ELECTRONIC MATERIALS PHYSICS
RESEARCH DIVISION

ELECTRONIC MATERIALS PHYSICS
RESEARCH DIVISION

The scopes of Physics for Electronic Material Research Group research activities are growthand characterization of electronic materials, theoretical/numerical studies of electronic material properties, and its application for electronic and optoelectronic devices. Research areas that we are interested in are divided into four major groups that are of nano semiconductors and other nanomaterials, compound semiconductors, superconductors and oxides, and theory and simulations. The study of nano semiconductor is focused on the growth and characterization of nano silicon, carbon and its application to some electronic and optoelectronic devices such as solar cell, light emitting diode, and color sensor. Other nanomaterials are also sinthesized using several physical method such as spray pyrolysis, sol gel, etc. Their applications in industry are also applied such as clarifier, purifier, Li-ion battery. In another field, the study of compound Semiconductor is focused to III-V compound semiconductor and their related materials, such as gallium, nitrate, and antimony based compound semiconductors. These deposited materials have been applied to various electronic devices such as ultraviolet and infrared detectors, gas sensor, laser diode, FET, and MOSFET. The study of superconductor and oxides are focused to superconductors, ferroelectric, pyroelectric and high dielectric materials investigation. Research on superconductor is directed to thin film high critical temperature superconductor and their application in electronic devices. The solid electrolyte fuel cell and supercapacitor application have also been studied. While, the study of theoretical and simulation is specialized to investigate the electronic material properties through theoretical analysis using computer simulation and its probability usage to experimental process of electronic devices.


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Grants

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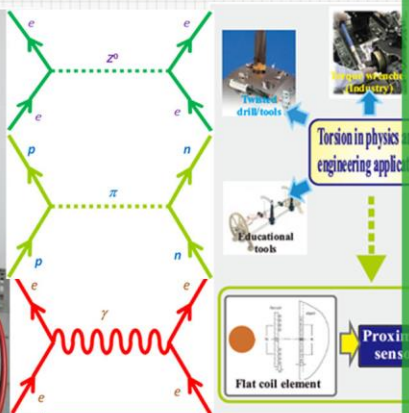

THEORETICAL HIGH ENERGY PHYSICS AND INSTRUMENTATION

RESEARCH DIVISION

THEORETICAL HIGH ENERGY PHYSICS AND INSTRUMENTATION
RESEARCH DIVISION

Research activities in the Theoretical High Energy Physics and Instrumentation Division are grouped into two main streams of research: researches in theoretical aspects of fundamental physics and researches in physical instrumentation. The first research stream concentrates on theoretical high energy physics, the frontier of physics in understanding of fundamental nature. The topics considered by members of the group include, among others, Einstein general relativity and other models of gravity, quantum field and gauge theory, topological gauge theory, supersymmetry, supergravity, superstring and brane world as well as analytical and numerical studies in integrable and dynamical systems. The second research stream weighs on the development of sensors and systems of instrumentation. This kind of research is very important in many aspects, including supporting research experiments in various research areas. The group develops, among others, sensors, imaging and signal processing, bioinstrumentation and also instrumentation for research and education purposes.


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10. Agus Suroso. *Program Riset dan Inovasi KK ITB 2013*.
11. Bobby Eka Gunara. *Program Riset dan Inovasi KK ITB 2013*.
12. Muhammad Miftahul Munir. *Program Riset dan Inovasi KK ITB 2013*.
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14. Triyanta. *Program Riset dan Inovasi KK ITB 2013*.
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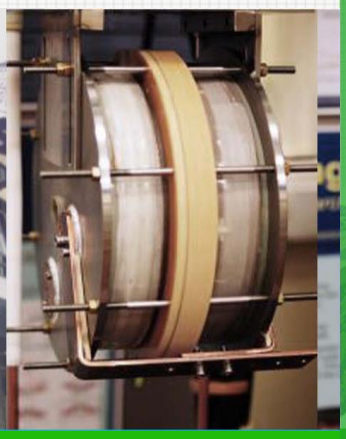

PHYSICS OF MAGNETISM AND PHOTONICS

RESEARCH DIVISION

PHYSICS OF MAGNETISM AND PHOTONICS
RESEARCH DIVISION

This group consists of two subgroups with fairly different research topics. Magnetic subgroup deals with functional magnetic materials for low dissipation and dissipationless power applications. Whereas, photonics subgroup focuses on theoretical and numerical study of periodic system and photonic crystal-based devices as well as experimental study of organic-based optical laser, amplifier, and nonlinear optical materials. Researches in photonic material and technology are focused on the development of photonic and nonlinear optical materials, waveguide based optical periodic systems, excitonic state for photo generation in oraganic solar cell, light emitting sources for applications in telecommunication/information technology as well as optical sensors. Meanwhile, researches in functional magnetic materials are focused on the transition metal oxides for applications in superconducting magnetic energy storage, spintronics and thermolectric. Our research is intertwined between theories, experiments and modeling by emphasizing analyses of experimental results based on theoretical model as well as computational and simulation results.


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Grants

1. Rahmat Hidayat. Pengembangan Sel Surya Berbasis Dye dengan Gel Elektrolit Hybrid dan Proses Fabrikasinya dengan Teknik Roll-printing Sederhana. *Insentif Riset Sinas 2013*.
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4. Priastuti Wulandari. *Program Riset dan Inovasi KK ITB 2013*.
5. Herman. *Program Riset dan Inovasi KK ITB 2013*.
6. Inge Magdalena Sutjahja. *Program Riset dan Inovasi KK ITB 2013*.
7. Alexander Agustinus P.I. *Program Riset dan Inovasi KK ITB 2013*.

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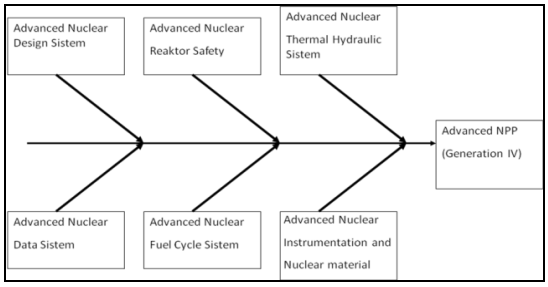
NUCLEAR PHYSICS AND BIOPHYSICS RESEARCH DIVISION

NUCLEAR PHYSICS AND BIOPHYSICS RESEARCH DIVISION

Nuclear Physics and Biophysics research division consists of two sub-division, namely Nuclear Physics sub-division and Biophysics sub-division. Nuclear Physics sub-division mainly studies several aspects of nuclear physics and its applications for research and development of the advanced nuclear power plants, especially Generation IV reactors. Generation IV reactors have particular characteristics, such as inherent safety, highly economic, nuclear waste burning capability, and ability to utilize the natural nuclear fuel effectively and efficient. Roadmap of Nuclear Physics sub-research division can be summarized in the following diagram.



Biophysics sub-division studies the physical processes in bio-system (molecule, cell, and organ) using several quantitative methods and measurements. Main research topics of this sub-research division are: molecular biophysics, membrane biophysics, radiation biophysics, and medical physics.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Grants

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6. Freddy Haryanto. *Program Peningkatan Kapasitas 2013*.
7. Rizal Kurniadi. *Program Riset dan Inovasi KK ITB 2013*.
8. Siti Nurul Khotimah. *Program Riset dan Inovasi KK ITB 2013*.
9. Sidik Permana. *Program Riset dan Inovasi KK ITB 2013*.
10. Sparisoma Viridi. *Program Riset dan Inovasi KK ITB 2013*.
11. Abdul Waris. *Program Riset dan Inovasi KK ITB 2013*.
12. Novitrian. *Program Riset dan Inovasi KK ITB 2013*.
13. Widayani. *Program Riset dan Inovasi KK ITB 2013*.

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35. Indah Rosidah, Maryam Afifah, Zaki Su'ud, Ferhat Aziz, H. Sekimoto and Sidik Permana, The Effect of the Number of Regions and Cycle Length to the Overall Performance of Pb-Bi Cooled Modified CANDLE Burn-Up Scheme Based, *International conference on Advances in Nuclear Science and Engineering (ICANSE) 2013*, 16-19 September 2013, Aston Hotel, Denpasar, Bali, Indonesia. 2013.
36. Fajar Arianto, Zaki Suud, Zuhair, Study on Neutronic of Very Small Pb – Bi Cooled No-Onsite Refueling Nuclear Power Reactor (VSPINNOR), *International conference on Advances in Nuclear Science and Engineering (ICANSE) 2013*, 16-19 September 2013, Aston Hotel, Denpasar, Bali, Indonesia. 2013.
37. Syeilendra Pramuditya, Minoru Takahashi, Computational Fluid Dynamics Study on Cross Flow Pressure Drop for Triangular Array Rod Assemblies with Wire, *International conference on Advances in Nuclear Science and Engineering (ICANSE) 2013*, 16-19 September 2013, Aston Hotel, Denpasar, Bali, Indonesia. 2013.
38. Khairul Basar, Reza Bachtiar, M. D. Badrianto, Effect of Geometrical Configuration of Radioactive Sources on Radiation Intensity of Betavoltaic Nuclear Battery System, *International conference on Advances in Nuclear Science and Engineering (ICANSE) 2013*, 16-19 September 2013, Aston Hotel, Denpasar, Bali, Indonesia. 2013.
39. R. Kurniadi, A Waris, S. Viridi, The Toy Model Reversibility of Fission Tield Calculation, *International conference on Advances in Nuclear Science and Engineering (ICANSE) 2013*, 16-19 September 2013, Aston Hotel, Denpasar, Bali, Indonesia. 2013.
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42. Indarta Kuncoro Aji, Abdul Waris, Study Utilization LiF, BeF2, ThF4, and UF4 (U235 enrichment) as fuel on Molten Salt Reactor FUJI-12 (100 MWe), *International conference on Advances in Nuclear Science and Engineering (ICANSE) 2013*, 16-19 September 2013, Aston Hotel, Denpasar, Bali, Indonesia. 2013.
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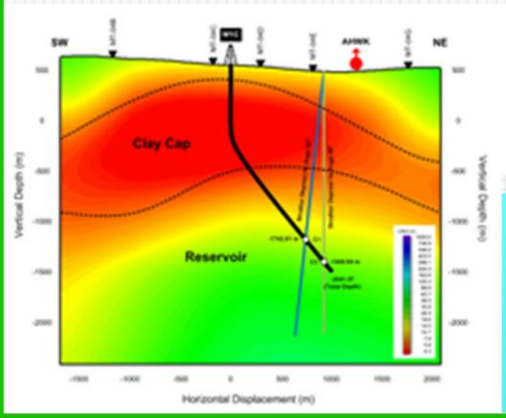

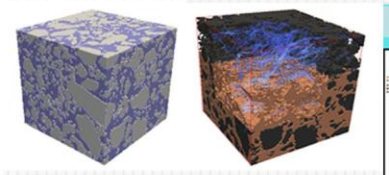

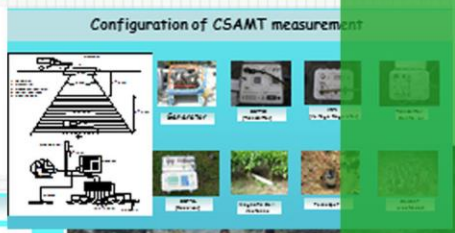

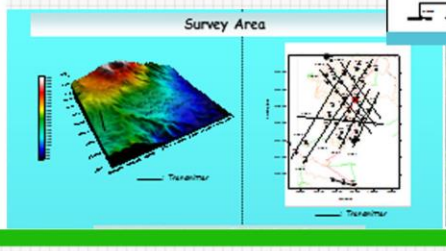

PHYSICS OF EARTH AND COMPLEX SYSTEMS

RESEARCH DIVISION

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RESEARCH DIVISION

The Physics of Earth and Complex Systems Division at ITB concern on complexity of the physical system and its response. By imposing the central paradigm namely complex system to the physical concepts, common tolls such as numerical methods, expert system and symbolic manipulation, nonlinearity and robust prediction, as well as fuzzy logic and artificial neural network are applied to solve the related problems.

Recently, the main research activities focused on the two main issues concerning the national energy survival and mitigation of the natural disaster. Those include electromagnetic technology for exploration, fluid dynamics and rock physics, as well as seismicity.

An international conference with the theme "Modeling and Inversion in Earth and Complex Systems" is being held on July this year. Reputable invited speakers on the related topic are joining the conference.


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Grants

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4. Umar Fauzi. Kaolinite Identification in Rock based on Microscope, SEM and Micro-Tomograpic Images. *Riset Asahi Glass Foundation 2013*.
5. Nurhasan. Investigation of Active Fault using 3D Elektromagnetik Modeling (Case Study in Active Sumatera Fault). *Penelitian Kerjasama Luar Negeri dan Publikasi Internasional 2013*.

6. Acep Purqon. *Program Peningkatan Kapasitas 2013*.
7. Fourier Dzar Eljabbar Latief. *Program Riset dan Inovasi KK ITB 2013*.
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8. Bagus Endar B. Nurhandoko, Amplitude various angles (AVA) phenomena in thin layer reservoir, *HAGI Annual Meeting*, Palembang-Indonesia. 2013.
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