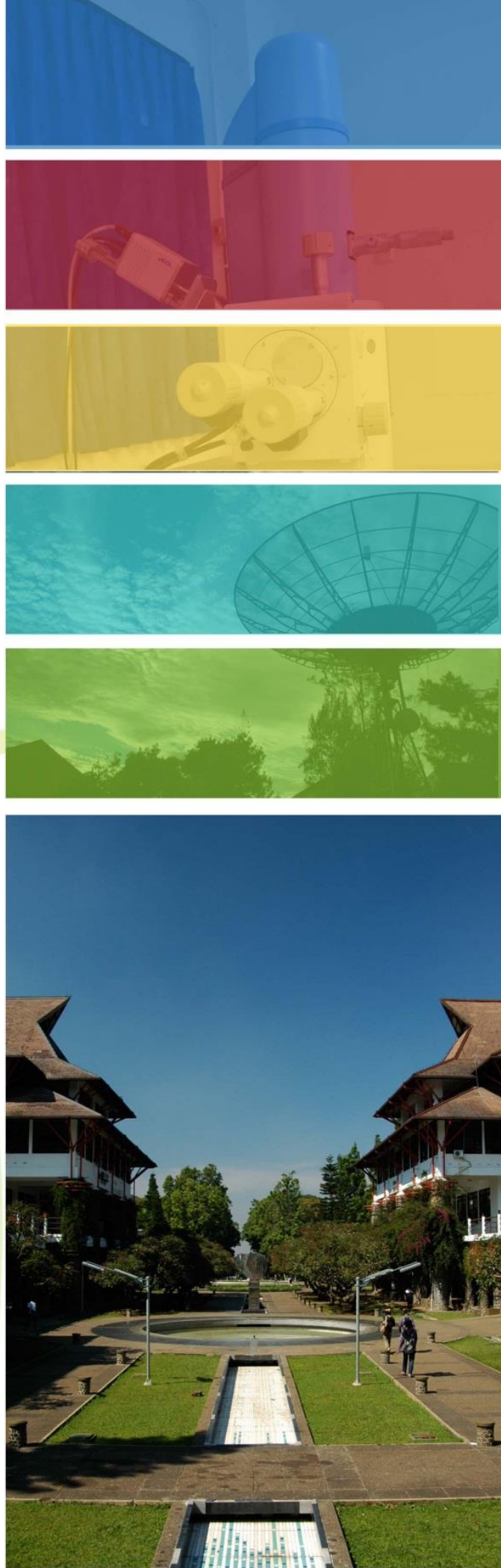




Faculty of Mathematics and Natural Sciences  
Institut Teknologi Bandung

# RESEARCH DIRECTORRY



**FMIPA** 2013

# RESEARCH DIRECTORY 2013

Faculty of Mathematics and Natural Sciences  
Institut Teknologi Bandung

Editors:

Yudi Soeharyadi (Chair)

Rudy Kusdiantara

Riri Murniati

Karunia Putrawijaya

Isti Rodiah

Rizka Rachmawati

Design and Layout:

Rizka Rachmawati



## FOREWORD

The Faculty of Mathematics and Natural Sciences was established in 1947, as a part of University Indonesia in Bandung. It finally became FMIPA (Fakultas Matematika dan Ilmu Pengetahuan Alam), as we currently know, with Institut Teknologi Bandung (ITB) charter in 1959. In its current status, 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 (Magnetic 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, in 2010, the Senate of the FMIPA 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

A recent acquisition of new laboratory equipments arriving in the late 2010, have been in full-operation in 2011. This includes Scanning Electron Microscope, Nuclear Magnetic Resonance Spectrometer (500 MHz), ESI-MS-TOF Spectrometer (HRMS), x-ray micro CT scan, and ESI-MS-Ion Trap Spectrometer. This acquisition has put FMIPA ITB in a better position to pursue its research agenda. International collaboration on research and education, student and staff exchanges, as well as international accreditation were significantly strengthened in the year 2012 as part of internationalization programs of FMIPA.

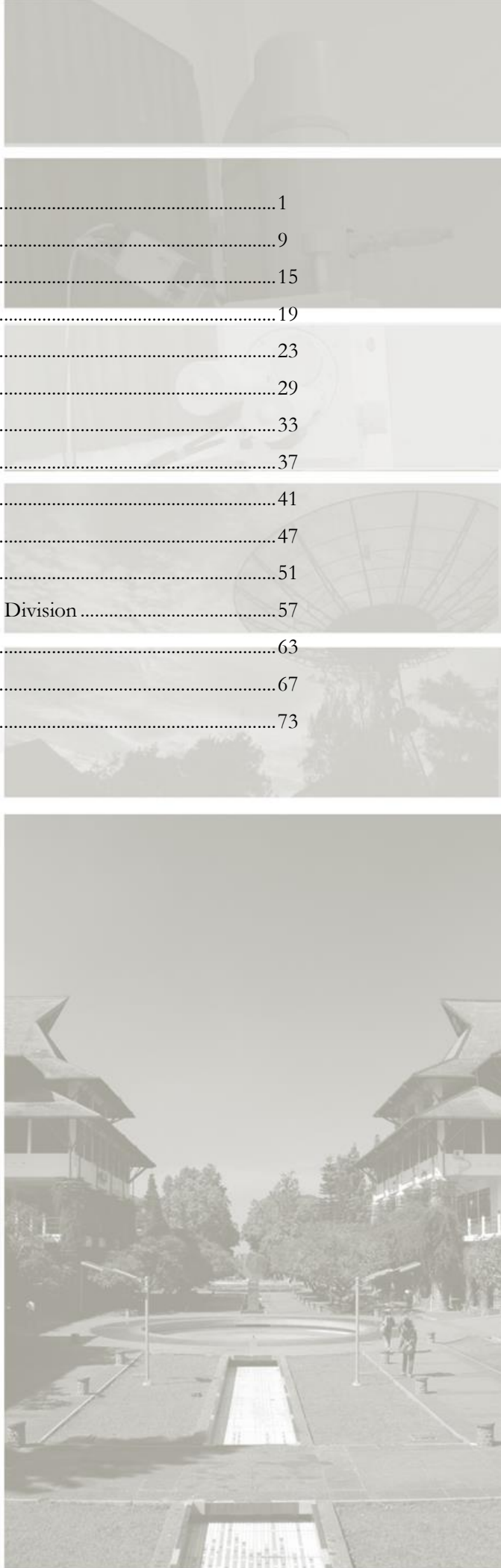
This directory documents several aspects of research activities done by the faculty members of FMIPA ITB, and their output during the year 2012. In the coming years, FMIPA will continue to strive in pursuing its research agenda, in order to forge its reputation in national and international scenes, while making contributions to science, to humanity and to the fulfillment of Indonesia's national interests and needs.

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



## CONTENTS

Astronomy Research Division.....	1
Analytical Chemistry Research Division.....	9
Biochemistry Research Division.....	15
Organic Chemistry Research Division.....	19
Inorganic and Physical Chemistry Research Division.....	23
Algebra Research Division.....	29
Analysis and Geometry Research Division.....	33
Combinatorial Mathematics Research Division.....	37
Industrial and Financial Mathematics Research Division.....	41
Statistics Research Division.....	47
Electronic Materials Physics Research Division.....	51
Theoretical High Energy Physics and Instrumentation Research Division.....	57
Physics of Magnetism and Photonics Research Division.....	63
Nuclear Physics and Biophysics Research Division.....	67
Physics of Earth and Complex Systems Research Division.....	73







# ASTRONOMY RESEARCH DIVISION

# ASTRONOMY RESEARCH DIVISION

The Astronomy research group is divided into 3 subgroups Galaxy and Cosmology, Stellar Physics and Solar System. Some of the research topics in the Galaxy and Cosmology subgroups are study of structure and dynamics of the Milky Way, distribution and evolution of galaxies, active galaxies (quasar), search for dark matter, and theoretical and observational cosmology. Research activities in the Stellar physics subgroup covers three main topics (a) theoretical studies and numerical modeling of stellar evolution, stellar structure and atmosphere, circum stellar envelope and matter, common and peculiar classes of variable stars (close binary, pulsating, accretion disk), light curve and spectral synthesis; (b) photometry and spectroscopy of variable stars (eclipsing binaries, Be stars, Helium stars, Am stars, cataclysmic binaries), polarimetry of Herbig Ae stars, and astrometry for orbital elements and physical parameters determination of visual double stars; (c) development of data acquisition and processing systems, i.e. CCD based astronomical instruments, image and data processing, data archival, knowledge-based classification of digital stellar spectra. Some of research topics in the Solar System research subgroup are Solar physics (sunspot proper motion and its relation to the solar area, solar terrestrial relationships, high solar energetic particle), solar system physics (planetary Mars atmosphere, Titan atmosphere), near earth asteroid and dynamics and evolution of asteroids (family asteroids), orbit calculation of hazardous objects and extra solar planets.





## Members

1. Dhani Herdiwijaya, (Leader)  
Dr. (Kyoto University)  
Solar Physics and Solar System  
dhani@as.itb.ac.id
2. Suryadi Siregar  
Dr. Prof., (Nice University)  
Small Bodies of The Solar System  
suryadi@as.itb.ac.id
3. Moedji Raharto  
Dr. (The University of Tokyo)  
Galactic Structure and Lunar Crescent Visibility  
moedji@as.itb.ac.id
4. Hakim L. Malasan  
Dr. (The University of Tokyo)  
Stellar Physics  
hakim@as.itb.ac.id
5. Chatief Kunjaya  
Dr. (Kyoto University)  
Stellar Physics and Quasars  
kunjaya@as.itb.ac.id
6. Endang Soegiartini  
Dr. (Institut Teknologi Bandung)  
Small Bodies of the Solar System  
endang@as.itb.ac.id
7. Premana Wardayanti Premadi  
Ph.D (The University of Texas)  
Galaxies and Cosmology  
premadi@as.itb.ac.id
8. Taufiq Hidayat  
Dr. (Universite de Paris VII)  
Solar System and Radio Astronomy  
taufiq@as.itb.ac.id
9. Mahasena Putra  
Dr. (The University of Tokyo)  
Stellar Physics  
mahasena@as.itb.ac.id
10. Budi Dermawan  
Dr. (The University of Tokyo)  
Solar System, Small Bodies of the Solar System  
budider@as.itb.ac.id
11. Hesti Retno Tri Wulandari  
Dr. (Technische Universitat Munchen)  
Dark Matter Cosmology  
hesti@as.itb.ac.id
12. Mochamad Ikb al Arifyanto  
Dr. (Universitaet Heidelberg)  
Galactic Structure  
ikbal@as.itb.ac.id
13. Muhamad Irfan Hakim  
Dr. (Institut Teknologi Bandung)  
Stellar Physics  
irfan@as.itb.ac.id
14. Aprilia  
Dr. (Tohoku University)  
Stellar Physics  
aprilialia@as.itb.ac.id
15. Yayan Sugiyanto  
Dr. (Institut Teknologi Bandung)  
Galaxies and Cosmology  
yayan@as.itb.ac.id
16. Ferry Mukharradi  
M.Si (Institut Teknologi Bandung)  
Galaxies and Cosmology  
ferry@as.itb.ac.id
17. Kiki Vierdayanti  
Dr. (Kyoto University)  
Stellar Physics  
kiki@as.itb.ac.id
18. Iratius Radiman  
Dr.  
iratius@as.itb.ac.id

19. Suhardja D. Wiramihardja

Dr. Prof.,  
suhardja@as.itb.ac.id (retired)

### Grants

1. Budi Dermawan, Hesti Retno Tri Wulandari, C. S Guritno, R. W. Wibowo, Sulistyowati. Dinamika orbit asteroid dan komet pada daerah dekat bumi. *Hibab Riset dan Inovasi KK ITB 2012*.
2. Dhani Herdiwijaya, A. Rachman. Badai matahari pada prediksi waktu jatuh sampah Antariksa sejak 2008 hingga 2012. *Hibab Riset dan Inovasi KK ITB 2012*.
3. Kiki Vierdayanti., Mahasena Putra, Chatief Kunjaya, D. Mandey, F. A. Azizi, Y. Ghea. Penentuan Spin Lubang Hitam pada Keadaan Super-Eddington. *Program Riset Peningkatan Kapasitas ITB 2012*.
4. Hesti Retno Tri Wulandari, Budi Dermawan, Mochamad Iqbal Arifyanto, I. Ibrahim, Sulistyowati. Pengaruh Eksentrisitas Orbit Terhadap Akresi dan Anihilasi WIMP Dark Matter oleh Bintang di Pusat Galaksi. *Hibab Riset dan Inovasi KK ITB 2012*.
5. Premana Wardayanti Premadi, Ferry Mukharradi, Y. Sugianto, R. F. T. Rahmania, L. T. Christina, A. T. Jaelani. Parameterisasi Evolusi Galaksi dalam Lingkungan Gugus Galaksi dan Medan. *Hibab Riset dan Inovasi KK ITB 2012*.

### Publication

1. Hidayat T., Putra M., Dermawan B., Hadi T. W., Premadi P. W., Herdiwijaya D. Clear sky fraction above Indonesia: an Analysis for Astronomical Site Selection. *Monthly Notices of the Royal Astronomical Society*, **427**: 1903-1917. 2012.
2. Fumi Y., Takashi I., Budi D., Tsuko N., Shigeru T., Ibrahimov M. A., Malhotra R., Huen I. W., Sawabe Y., Haji M., Saito R., Hirai M., Miyasaka S., Fukushima H., Sato H., Yusuke. Light curves of the Karin family asteroids. *Submitted to Icarus*. 2012.
3. Irawati P., Putra M., Herdiwijaya D., Zen F. P. Population synthesis of cataclysmic variable star: I. Formalism and initial study on the post common-envelope stage. *Submitted to Astrophysics and Space Science*. 2012.
4. Herdiwijaya D., Djamal M., Gunawan H. Design of Mobile and Robotic Observing System with Special Telescope Baffle for Searching Young Lunar Crescent. *Jurnal Otomasi, Kontrol dan Instrumentasi*, **4(1)**: 1-7. 2012.
5. Herdiwijaya D. The Characteristics of Solar Wind Parameters During Minimum Periods of Solar Cycle 24 and Impact on Geoeffectiveness. *AIP Conference Proceedings-International Conference on Physics and Its Applications (ICPAP)*, **1454**: 25-31. 2012.
6. Arumaningtyas E. P., Raharto M., Herdiwijaya D. Morning Twilight Measured at Bandung and Jombang. *AIP Conference Proceedings-International Conference on Physics and Its Applications (ICPAP)*, **1454**: 29-31. 2012.
7. Trihermanto F., Herdiwijaya D. The Surface Distribution of Solar Energetic Particles on the Earth and Southern Atlantic Anomaly. *AIP Conference Proceedings-International Conference on Physics and Its Applications (ICPAP)*, **1454**: 32-34. 2012.
8. Raharto M., Sopwan N., The Possible Range Arc of Vision for Aphelion and Perihelion Group of Hilal Visibility. *AIP Conference Proceedings-International Conference on Physics and Its Applications (ICPAP)*, **1454**: 35-38. 2012.
9. Yusuf M., Mandey D., Hadiputra I. P. W., Putra M., Irfan M. Speckle Observation of Visual Double Stars at Bosscha Observatory. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
10. Hidayat T., Ridwan N. Analyses of MODIS data for a future astronomical observatory in Indonesia. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
11. Premadi P., Christina L., Trirahmania F. A detailed look at the late type galaxies in nearby clusters. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
12. Malasan H. L., Suherli J. Spectroscopic Study of Novae in Early 2012 at Bosscha Observatory. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.



13. Irfan M., Hakim L. M., Azzahra M., Durachman L. H., Nisfillaili H., Taufani M. D., Putra M. Report of Double Stars Measurement at Bosscha Observatory in 2012. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
14. Sopwan N., Raharto M. Lower Limit Hilal Visibility Criteria for the Naked Eye and Telescopic Observation. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
15. Herdiwijaya D., Rachman A. On the Effects of Solar Storms to the Decaying Orbital Space Debris. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
16. Kesumaningrum R., Herdiwijaya D. Deep Coronal Hole Associated With Quiscent Filament. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
17. Dermawan B., Wulandari H. R. T., Wibowo R. W., Sulistyowati, Guritno C. S. Orbit of the Short-lived Sun-grazing Comet C/1999 X3. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
18. Hakim M. I., Putra M., Kunjaya C., Sutamo D. Rotational Velocity Evolution of Herbig Ae Stars: Be Stars Progenitor? *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
19. Suherli J., Malasan H., Putra M., Mayangsari L., Ramadhan D., Haans G. The Bosscha Observatory's BIMA Program. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
20. Sulistyowati, Wulandari H. R. T., Dermawan B., Arifyanto M. I., Ibrahim I. Effects of Dark Matter on Stellar Structure and Evolution. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
21. Soegiarti E., Radiman I., Siregar S., Fauzi U. The Dynamical Behaviour of Asteroid 1566 Icarus. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
22. Priyatikanto R., Arifyanto M. I., Wulandari H. R. T. Open Clusters Evolution in Binary System: How They Dissolved. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
23. Jaelani A., Premadi P. W. The Hubble Constant Estimation Using 18 Gravitational Lensing Time Delays. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
24. Rachman A., Herdiwijaya D. Identifying Solar Wind Structures Related to Garuda 1 Satellite Anomaly by Analyzing Solar Wind and IMF Parameters. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
25. Azizi F. A., Vierdayanti K., Putra M., Kunjaya K. Behavior of Long Term Interval of State A in GRS 1915+105. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
26. Ghea Y., Putra M., Dermawan B., Wibowo R., Sulistyowati, Guritno C., Wulandari H. R. T. Effect of Initial Inclination to the Stability of Triple Star Systems. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
27. Oktavia R., Wulandari H. R. T. Rotation Curves of Early Type Spiral Galaxies with Modification of Gravity. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
28. Husnindriani P., Wulandari H. R. T. Distribution of Dark Matter in Late-type Spiral Galaxies. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
29. Mayangsari L., Putra M., Priyatikanto R. On The Period Determination of ASAS Eclipsing Binaries. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
30. Akbar E., Setiawan A., Sulaeman M., Putra M., Haans G., Ramadhan D. Design Proposal of CCD Mount for Schmidt's Bima Sakti Telescope. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
31. Tampubolon C. M., Hidayat T. Searching for Planets from Data Mining in Kepler Released Data. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
32. Hapsari R. D., Hidayat T., Mumtahana F. Recent Development of Radio JOVE Telescope at the Bosscha Observatory. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.

33. Mumtahana F., Hidayat T., Hapsari R. D. Characterization of the "Hidrogen" 6m Radio Telescope at the Bosscha Observatory. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
34. Siregar S., Sutarno V. A. The Trajectory Around Lagrangian Point L<sub>2</sub> in the Earth-Moon System. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
35. Raharto M. Search for Bright Stars with Infrared Excess. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
36. Arumaningtyas E. P., Herdiwijaya D., Raharto M. Reading Quality of The Sky Quality Meter. *The 4<sup>th</sup> International Conference on Mathematics and Natural Sciences (ICMNS-2012)*. 2012.
37. Dermawan B., Wulandari H. R. T., Putra M., Wibowo R. W., Guritno C. S., Sulistyowati. Searching for New Venus Co-orbital Asteroids. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
38. Siregar S., Soegiartini E. Orbital Evolution of 4179 Toutatis. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
39. Herdiwijaya D. Debris Impact on Low Earth Orbit Space Mission. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
40. Premadi P. W. Envisioning the Advancement of Astronomy and Astrophysics for the Next Ten Years. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
41. Raharto M., Sofwan N. Astronomical Phenomena and National Holiday on Calendar. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
42. Hidayat T. Developing Radio Astronomy at the Bosscha Observatory. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
43. Malasan L. M. Collaboration in Eclipsing Binary Program. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
44. Arifyanto I. Physical Parameters of Open Clusters in the Anti-Galactic Center. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
45. Irawati P., Putra M., Soonthornthum B. On the Evolutionary Scenario of IK Pegasi. *The 4<sup>th</sup> South-East Asian Astronomy Network (SEAN) Meeting 2012*. 2012.
46. Braga R. F., Sicardy B., Ortiz J. L., Duffard R., Camargo J. I. B., Lecacheux J., Colas F., Vachier F., Tanga P., Sposetti S., Brosch N., Kaspi S., Manulis I., Baug T., Chandrasekhar T., Ganesh S., Jain J., Mohan V., Sharma A. Stellar Occultations by Large TNOs on 2012: The February 3rd by (208996) 2003 AZ84, and the February 17th by (50000) Quaoar. *Bulletin of the American Astronomical Society*, 44. 2012.
47. Wibowo R. W., Dermawan B., Wulandari H. R. T., Putra M., Sulistyowati, Guritno C. S. Orbital Coupling between Distributions of Semimajor Axis and Inclination of Near-Earth Asteroid Segregated at about 2 AU. *The 5<sup>th</sup> Asian Physics Symposium (APS) 2012*. 2012.
48. Herdiwijaya D. The Sources of Multi Spectral Energy of Solar Energetic Electrons. *The 5<sup>th</sup> Asian Physics Symposium (APS) 2012*. 2012.
49. Mumpuni E. S., Herdiwijaya D., Djamil M. Multiwavelength Analysis from Tomography Study on Solar Chromosphere. *The 5<sup>th</sup> Asian Physics Symposium (APS) 2012*. 2012.
50. Siregar S., Daud N. On the Probability Density Function and Tisserand Invariant of Orbital Elements of the NEAS. *IAU General Assembly XXVII*. 2012.
51. Putra M. Pendidikan Astronomi di Indonesia Tahun 2001-2011. *Prosiding Seminar Pendidikan Astronomi*, 19-23. 2012.
52. Husnindriani P., Audina A. R., Hidjriyati, Lestari M., Dermawan B., Malasan H. L. Inisiasi Kegiatan Astronomi di Kelompok Ilmiah Remaja (KIR) SMMAN 1 Banjarmasin. *Prosiding Seminar Pendidikan Astronomi*, 35-53. 2012.
53. Permani S., Premadi P. W. Pendidikan Astronomi sebagai Sains. *Prosiding Seminar Pendidikan Astronomi*, 59-60. 2012.
54. Liliawati W., Rustaman N., Herdiwijaya D., Rusdiana D. Peningkatan Kemampuan Konsep IPBA Terpadu Melalui Pembelajaran Berbasis Kecerdasan Majemuk pada Mahasiswa Calon Guru SMP. *Prosiding Seminar Nasional Fisika III*. 2012.

55. Raharto M., Yuhamah S. Astronomical Phenomena Above the Borobudur Temple. *Prosiding Seminar Nasional Fisika III*. 2012.
56. Arumaningtyas E. P., Raharto M., Herdiwijaya D. Profil Kecerlangan Langit Sebagai Penentu Waktu Subuh dan Visibilitas Hilal. *Prosiding Seminar Nasional Fisika III*. 2012.
57. Sopwan N., Raharto M. Hilal Metonik: Usulan Kriteria Visibilitas Hilal. *Prosiding Seminar Nasional Fisika III*. 2012.
58. Liliawati W., Rustaman N., Herdiwijaya D., Rusdiana D. Analisis Karakter Diri Mahasiswa yang terbangun melalui Perkuliahan IPBA Terpadu Berbasis Kecerdasan Majemuk. *Prosiding Seminar Nasional Penelitian, Pendidikan dan Penerapan MIPA*. Universitas Negeri Yogyakarta. 2 Juni 2012.
59. Raharto M. Search for Solution for a Unique Islamic Calendar. *Lokakarya International Penyatuan Kalender Hijriyah*. 2012.
60. Ahmad N., Siregar S. Kajian Potensi Tumbukan Asteroid 1950 DA dengan Bumi. *Majalah Matahari dan Antariksa seri ke-6 edisi 2012*, p. 29-40. 2012.
61. Dani T., Siregar S. Profil Orbit Near Earth Comet (NEC). *Majalah Matahari dan Antariksa seri ke-6 edisi 2012*, p. 41-46. 2012.





1.



# 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.





## Members

- |                                   |  |
|-----------------------------------|--|
| 1. Muhammad Bachri Amran (Leader) | Dr., Prof. (Universite Louis Paster, France)<br>amran@chem.itb.ac.id |
| 2. Buchari                        | Dr., Prof. (USTL Montpellier, France)<br>buchari@chem.itb.ac.id      |
| 3. Aminudin Sulaeman              | Dr. (Institut Teknologi Bandung),<br>amin@chem.itb.ac.id             |
| 4. Henry Setiyanto                | Dr. (Institut Teknologi Bandung)<br>henry@chem.itb.ac.id             |
| 5. Indra Noviandri                | Dr. (University of Sydney)<br>innov@chem.itb.ac.id                   |
| 6. Muhammad Ali Zulfikar          | Dr. (National University of Malaysia)<br>zulfikar@chem.itb.ac.id     |
| 7. Rusnadi                        | Dr. (Institut Teknologi Bandung),<br>rusnadi@chem.itb.ac.id          |
| 8. Samitha Dewi Djajanti          | Dra. (Institut Teknologi Bandung)<br>samitha@chem.itb.ac.id          |
| 9. Suryo Gandasamita              | Dr. (University Montpellier II, France)<br>suryo@chem.itb.ac.id      |
| 10. Ria Sri Rahayu                | M.Si. (Institut Teknologi Bandung)<br>ria@chem.itb.ac.id             |

## Grants

1. Muhammad Bachri Amran. Ion imprinted polymer (IIPs) untuk prakonsentrasi dan analisis renik ion logam berat berbasis flow injection analysis (FIA). *Hibah Riset Desentralisasi Dikti 2012*.
2. Indra Noviandri. Elektroda amalgam tembaga untuk monitoring kadar renik timbal di dalam air Sungai Cikapundung secara voltammetri. *Hibah Riset dan Inovasi KK 2012*.
3. Indra Noviandri. Pengembangan elektoda termodifikasi molecularly imprinted polymer (MIP) untuk analisis kurkumin. *Hibah Penelitian Kerjasama antar Lembaga dan PT 2012*.
4. Meyliana Wulandari, Muhammad Bachri Amran. Curcumine molecularly imprinted polymer. *Sandwich Program, Spain 2012*.
5. Handajaya Rusli, Muhammad Bachri Amran. Membrane bioreactor. *Sandwich Program, Italy 2012*.
6. Muhammad Ali Zulfikar. Peningkatan kualitas dan produksi industri garam rakyat. *Hibah Program Pengabdian Kepada Masyarakat 2013*.
7. Indra Noviandri. Kolorimeter dengan sensor light dependence resistor untuk praktikum siswa SMA. *Hibah Program Pengabdian Kepada Masyarakat 2013*.

## Publication

1. Irdhawati I., Tatsumi H., Noviandri I., Buchari, Ibrahim S. Cyclic voltammetry of ion transfer for phenylpropanolamine hydrochloride at water|nitrobenzene interface. *J. Chin. Chem. Soc.*, **59(1)**: 40-45. 2012.
2. Saraswaty V., Setiyanto H., Nurhajati J. Antibacterial activity from *Croton argyratus* stem bark extract. *International Journal of PharmTech Research*, **4(1)**: 190-193. 2012.
3. Handayani N., Loos K., Wahyuningrum D., Buchari, Zulfikar M. A. Immobilization of *Mucor miehei* lipase onto macroporous aminated polyethersulfone membrane for enzymatic reactions. *Membranes*, **2**: 198-213. 2012.

4. Zunita M., Wahyuningrum D., Buchari, Bundjali B. Investigation of corrosion inhibition activity of 3-butyl-2,4,5-triphenylimidazole and 3-butyl-2-(2-butoxyphenyl)-4,5-diphenylimidazole toward carbon steel in 1% NaCl solution. *International J. Electrochem. Sci.*, **7(4)**: 3274-3288. 2012.
5. Noviandri I., Rakhmana R. Carbon paste electrode modified with carbon nanotubes and poly(3-aminophenol) for voltammetric determination of paracetamol. *International J. Electrochem. Sci.*, **7(5)**: 4479-4487. 2012.
6. Zufikar M. A., Mariske E. D., Djajanti S. D. Adsorption of lignosulfonate compounds using powdered eggshell. *Songklanakarinn J. Sci. Technol.*, **34(3)**: 309-316. 2012.
7. Muhida R., Rahman M. M., Chowdhury M. S. H., Setiyanto H., Zainuddin H., Zakaria A. B., Kasai H. Theoretical study of atomic level understanding of the reactive ion etching (RIE). *Journal of Computational and Theoretical Nanoscience*, **9(8)**: 1067-1069. 2012.
8. Rahman M. M., Muhida R., Chowdhury M. S. H., Setiyanto H., Zainuddin H., Zakaria A. B., Kasai H. Theoretical investigation of a benzene-vanadium multiple-decked sandwich chain on a gold surface. *Journal of Computational and Theoretical Nanoscience*, **9(8)**: 1063-1066. 2012.
9. Sianipar A., Amran M. B., Buchari, Arcana I. M. Effect of degree binary complex of imprint ion on the extraction of zircon ion. *IOSR Journal of Applied Chemistry (IOSRJAC)*, **1(4)**: 15-19. 2012.
10. Rusnadi, Buchari, Amran M. B., Wahyuningrum D. Cerium adsorption using 1-phenyl-3-methyl-4-benzoyl-5-pyrazolone(HPMBP) loaded calcium alginate beads. *International Journal of Engineering Research and Applications (IJERA)*, **2(5)**: 496-499. 2012.
11. Murniati A., Buchari, Gandasmita S., Nurachman Z. Synthesis and characterization of polypyrrole polyphenol oxidase (PPy/PPO) on platinum electrode. *Research J. Pharm. Biol. Chem. Sci.*, **3(4)**: 855. 2012.
12. Rahayu R. S., Noviandri I., Buchari, Abdullah M., Hinoure T. The effect of laser pulse irradiation at glassy carbon electrode on the electrochemistry of dopamine an ascorbic acid. *Int. J. Electrochem. Sci.*, **7**: 8225-8265. 2012.
13. Zufikar M. A., Sulaeman A. Transport of rare earth elements (REEs) through hollow fiber supported liquid membrane (HFSLM) using di-(2-ethylhexyl) phosphoric acid and trybutylphosphate as a carrier. *Int. J. ChemTech Res.* 2012.
14. Muhida R., Rahman M. M., Chowdhury M. S. H., Setiyanto H., Zainuddin H., Azmi B. Z. Density functional study of spin polarization on a carbon material with a hexagonal structure induced by iron atoms. *Journal of Computational and Theoretical Nanoscience*. 2012.
15. Setiyanto H., Simbolon I. B. L., Rifka, Zufikar M. A., Amran M. B., Buchari. Comparative study on leachate in old and new municipal solid waste landfills at Bandung-Indonesia. *European Journal of Scientific Research*, **79(2)**: 159-165. 2012.
16. Rahayu R. S., Noviandri I., Buchari, Abdullah M., Hinoure T. The effect of laser pulse irradiation at glassy carbon electrode on the electrochemistry of dopamine an ascorbic acid. *Int. J. Electrochem. Sci.*, **7**: 8225-8265. 2012.
17. Widarti S., Amran M. B., Nurrahman Z., Buchari, Takeuchi T. Novel material; non catalytic functioning of linear polystyrene with diaminopropane- $\beta$ -cyclodextrin. *International Seminar on Analytical Sciences 2012*. Medan, Indonesia. 2012.
18. Koesmawati T. A., Buchari, Francesconi K. A., Ng J. C. Homogeneity and stability testing of a candidate reference material for the determination of total arsenic in tuna fish sample. *Proceeding of 4th Arsenic Congress: Arsenic in the Environment*: 370-372. Cairns-Australia. 2012.
19. Rahayu R. S. The effect of laser pulse irradiation in increasing the sensitivity of the measurement of dopamine using three types of electrodes. *A Joint Conference of 3rd Regional Electrochemistry Meeting of South-East, 27th Philippine Chemistry Congress and 2012 Asia-Pacific Conference on Analytical Science*. Metro Manila, Philippine. 2012.

20. Rusli H., Gandasasmita S., Amran M. B. Hybrid membrane for separation of starch and maltosa. *A Joint Conference of 3rd Regional Electrochemistry Meeting of South-East, 27th Philippine Chemistry Congress and 2012 Asia-Pasific Conference on Analytical Science*. Metro Manila, Philippine. 2012.
21. Murniati A., Buchari, Gandasasmita S., Nurachman Z. Preparation and characterization of polypyrrol film on glassy carbon and platinum electrodes. *A Joint Conference of 3rd Regional Electrochemistry Meeting of South-East, 27th Philippine Chemistry Congress and 2012 Asia-Pasific Conference on Analytical Science*. Metro Manila, Philippine. 2012.
22. Mulyani R., Buchari, Noviandri I., Ciptati C. Voltametry studies for the electro-oxidation of CTAB using Pt/Co electrode in the KOH supporting elctrolyte. *A Joint Conference of 3rd Regional Electrochemistry Meeting of South-East, 27th Philippine Chemistry Congress and 2012 Asia-Pasific Conference on Analytical Science*. Metro Manila, Philippine. 2012.
23. Saefurohman A., Buchari, Noviandri I. Electrode selecive ion La(III) with TBP and D2EHPA as ionophore. *A Joint Conference of 3rd Regional Electrochemistry Meeting of South-East, 27th Philippine Chemistry Congress and 2012 Asia-Pasific Conference on Analytical Science*. Metro Manila, Philippine. 2012.
24. Sianipar A., Amran M. B., Buchari, Arcana I. M. Incoporation of Network in Synthesis of Zircon-Imprinted Polymer and Its Effect on Zircon Ion Extraction. *ICMNS 2012*. 2012
25. Noviandri I., Amran M. B., Dewi P. S. Poly(Eriochrome Black T) modified Carbon Paste Electrode as Amperometric Detector. *ICMNS 2012*. 2012.
26. Saefurohman A., Buchari, Noviandri I. Potentiometric selectivity of polymer-membrane electrodes based on Lanthanum. *ICMNS 2012*. 2012.
27. Ivansyah A. L., Gandasasmita S., Buchari. Synthesis of Zeolite Membranes on Stainless-Steel Grid for Salt Solution Filtration by Reverse Osmosis. *ICMNS 2012*. 2012.
28. Wulandari M., Amran M. B., Ruiz U., Bondi Mcm., Lopez D. Molecularly Imprinted Polymer as Selective Functional Material for Separation-Preconcentration and Curcumin Analysis. *ICMNS 2012*. 2012.
29. Koesmawati T. A., Buchari, Sulaeman A., Ibrahim S. Pembuatan kandidat bahan acuan (reference material) ikan tuna untuk analisis arsen total. *Seminar Nasional Kimia Analitik*. JCC-Jakarta. 2012.







# 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.





## Members

1. Fida Madayanti Warganegara Dr. (University of New South Wales)  
fida@chem.itb.ac.id
2. Rukman Hertadi,(Leader) Dr. (Tokyo Institute of Technology)  
rukman@chem.itb.ac.id
3. Akhmaloka Dr., Prof. (University of Kent at Canterbury)  
loka@chem.itb.ac.id
4. Zeily Nurachman Dr. (Tokyo Institute of Technology)  
zeily@chem.itb.ac.id
5. Dessy Natalia Dr. (University of Kent at Canterbury)  
dessy@chem.itb.ac.id
6. Enny Ratnaningsih Dr. (Monash University)  
enny@chem.itb.ac.id
7. Santi Nurbaiti Dr. (Institut Teknologi Bandung)  
santi@chem.itb.ac.id
8. Sarwono Hadi Drs.,  
sarwono@chem.itb.ac.id
9. Yanti Rachmayanti Dr.,  
yanti@chem.itb.ac.id
10. Ihsanawati Dr. (Tokyo Institute of Technology)  
ihsanawati@chem.itb.ac.id
11. Made Puspasari Widhiastuty Dr. (Institut Teknologi Bandung),  
puspa@chem.itb.ac.id
12. Fifi F. Masduki M.Si. (on leave)

## Grants

1. Zeily Nurachman. Pengembangan produksi biomassa mikroalga sebagai sumber minyak nabati untuk pangan, obat-obatan dan energi. *Hibah MP3I DIKTI 2011*.
2. Akhmaloka. Analisis komunitas mikroorganisme eukayot selama proses pembuatan kompos manure sapi. *Hibah Pascasarjana DIKTI Tahun Kedua 2011*.
3. Dessy Natalia. Konsorsium Vaksin Hepatitis Nasional. *SINAS (Anggota Peneliti) 2011*.
4. Ihsanawati. Konsorsium Vaksin Tuberculosis Nasional. *SINAS (Anggota Peneliti) 2011*.

## Publication

1. Viera B. V. E., Madayanti F., Aryantha I. N. P., Akhmaloka. Succession of eukaryotic communities during traditional composting of domestic waste based on PCR-DGGE analysis. *Journal of Pure and Applied Microbiology*, **6(2)**: 525-536. 2012.
2. Nurbaiti S., Martopravairo M. A., Akhmaloka, Hertadi R. The role of electrostatic interactions on Klentaq1 insight for domain separation. *Bioinformatics and Biology Insights 2012*, **6**: 225-234. 2012.
3. Widhiastuty M. P., Wahyudi S. T., Moeis M. R., Madayanti F., Akhmaloka. Cloning and sequence analysis of lipase gene from DMS3 isolate. *Biosciences Biotechnology Research Asia 2012*, **9(1)**: 187-192. 2012.
4. Nurachman Z., Hartati, Anita S., Anward E. E., Novirani G., Mangindaan B., Gandasasmita S., Suantika G. Oil productivity of the tropical marine diatom *Thalassiosira sp.* *Bioresource Technology 2012*, **108**: 240-244. 2012.
5. Purkan, Ihsanawati, Syah Y. M., Retnoningrum D. S., Noer A. S., Shigeoka S., Natalia D. Novel mutations in katG gene of a clinical isolate of isoniazid-resistant *Mycobacterium tuberculosis*. *Biologia*, **67(1)**: 41-47. 2012.
6. Ngili Y., Noer A. S., Ahmad A. S., Syukriani Y. F., Natalia D., Syah Y. M. Variants analysis of human mitochondrial genome mutation: Study on Indonesian human tissues. *International Journal of ChemTech Research 2012*, **4(2)**: 720-728. 2012.

7. Nurachman Z., Brataningtyas D. S., Hartati, Panggabean L. M. G. Oil from the tropical marine benthic-diatom *Navicula sp.* *Applied Biochemistry and Biotechnology* 2012, **168(5)**: 1065-1075. 2012.
8. Aldina S. S., Ihsanawati, Ernawati A. G. R. Molecular cloning of PhoR sensor domain from *Mycobacterium tuberculosis* for structure-based discovery of novel anti-tubercular. *Journal of Life Sciences* 2012, **6(3)**: 268-275. 2012.
9. Murniati A., Buchari, Gandasmita S., Nurachman Z. Synthesis and characterization of polypyrrole polyphenol oxidase (PPy/PPO) on platinum electrode. *Research J. Pharm. Biol. Chem. Sci.*, **3(4)**: 855. 2012.



# 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.





## Members

- |                                |   |
|--------------------------------|---|
| 1. Yana Maolana Syah, (Leader) | Dr., Prof. (The University of Western Australia)<br>yana@chem.itb.ac.id |
| 2. Euis Holisotan Hakim        | Dr., Prof. (Institut Teknologi Bandung)<br>euis@chem.itb.ac.id          |
| 3. Ciptati                     | Dr. (Monash University)<br>ciptati@chem.itb.ac.id                       |
| 4. Deana Wahyuningrum          | Dr. (Institut Teknologi Bandung)<br>deana@chem.itb.ac.id                |
| 5. Didin Mujahidin             | Dr. (University of Heidelberg)<br>didin@chem.itb.ac.id                  |
| 6. Hidajat Muchisinudin        | Drs.<br>hidayat@chem.itb.ac.id  |
| 7. Lia Dewi Juliawaty          | Dr. (Chiba University)<br>liadewi@chem.itb.ac.id                        |
| 8. Megawati Santoso            | Dr. (The University of Iowa)<br>mega@chem.itb.ac.id                     |
| 9. Rita Anggraini              | Dr.,<br>rita@chem.itb.ac.id   |
| 10. Nizar Happyana             | M.Si.   |

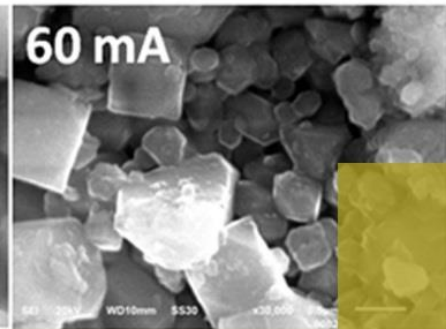
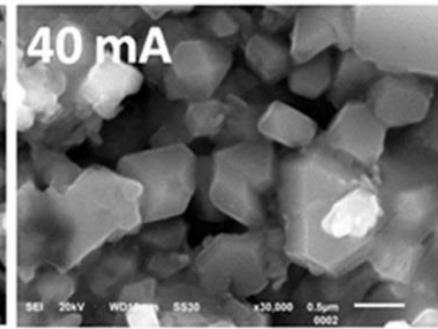
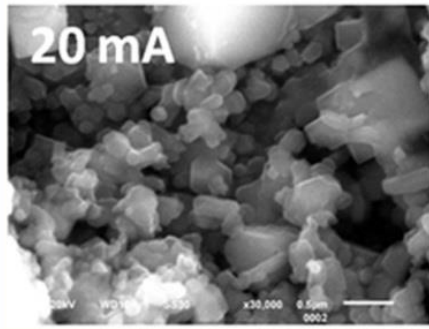
## Grants

1. Yana M. Syah, Euis H. Hakim. Kajian fitokimia, sifat sitotoksik, dan sifat antioksidan senyawa-senyawa turunan fenol dari tumbuhan *Macaranga* Indonesia. *Hibab Doktor Unggulan 2012*.
2. Didin Mujahidin, Yana M. Syah. Sintesis flavonoid terprenilasi yang bersifat antioksidan. *Hibab Doktor Unggulan 2012*.
3. Yana M. Syah, Lia D. Juliawaty. Sifat antimikroba komponen terpenoid dari tumbuhan *Curcuma xanthorrhiza*. *Hibab Riset Desentralisasi 2012*.
4. Yana M. Syah, Didin Mujahidin. Antimikroba dari komponen *Macaranga trichorcapa*. *Hibab Riset KK 2012*.
5. Deana Wahyuningrum. Sintesis dan karakterisasi *ionic liquid* dari turunan imidazol sebagai *green solvent* dan inhibitor korosi pada baja karbon dalam larutan NaCl 1%. *Hibab Doktor Unggulan 2012*.
6. Deana Wahyuningrum. Pengembangan metoda hidrolisis lignoselulosa menggunakan cairan ionik dan selulase. *Sinas Ristek 2012*.

## Publication

1. Handayani N., Loos K., Wahyuningrum D., Buchari, Zulfikar M. A. Immobilization of *Mucor miehei* lipase onto macroporous aminated polyethersulfone membrane for enzymatic reactions. *Membranes*, **2**: 198-213. 2012.
2. Zunita M., Wahyuningrum D., Buchari, Bundjali B. Investigation of corrosion inhibition activity of 3-butyl-2,4,5-triphenylimidazole and 3-butyl-2-(2-butoxyphenyl)-4,5-diphenylimidazole toward carbon steel in 1% NaCl solution. *International J. Electrochem. Sci.*, **7(4)**: 3274-3288. 2012.
3. Tanjung M., Hakim E. H., Elfahmi, Latip J., Syah Y. M. Dihydroflavonol and flavonol derivatives from *Macaranga recurvata*. *Nat. Prod. Commun.*, **7**: 1309-1310. 2012.
4. Purkan, Ihsanawati, Syah Y. M., Retnoningrum D. S., Noer A. S., Shigeoka S., Natalia D. Novel mutations in katG gene of a clinical isolate of isoniazid-resistant *Mycobacterium tuberculosis*. *Biologia*, **67(1)**: 41-47. 2012.
5. Syah Y. M., Ghisalberti E. L. More phenolic derivatives with an irregular sesquiterpenyl side chain from *Macaranga pruinosa*. *Nat. Prod. J.*, **2**: 45-49. 2012.

6. Agustina W., Juliawaty L. D., Hakim E. H., Syah Y. M. Flavonoids from *Macaranga lowii*. *ITB Journal of Science*, **44A(1)**: 13-18. 2012.
7. Ramadhan L. O. A. N., Radiman C. L., Suendo V., Wahyuningrum D., Valiyaveettil S. Synthesis and characterization of polyelectrolyte complex N-succinyl chitosan-chitosan for proton exchange membrane. *Procedia Chemistry*, **4**: 114-122. 2012.
8. Rusnadi, Buchari, Amran M. B., Wahyuningrum D. Cerium adsorption using 1-phenyl-3-methyl-4-benzoyl-5-pyrazolone(HPMBP) loaded calcium alginate beads. *International Journal of Engineering Research and Applications (IJERA)*, **2(5)**: 496-499. 2012.
9. Ngili Y., Noer A. S., Ahmad A. S., Syukriani Y. F., Natalia D., Syah Y. M. Variants analysis of human mitochondrial genome mutation: Study on Indonesian human tissues. *International Journal of ChemTech Research 2012*, **4(2)**: 720-728. 2012.



# 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).





## Members

1. Ismunandar (Leader) Ph.D., Prof. (University of Sydney)  
Inorganic Material Chemistry  
ismu@chem.itb.ac.id (Leader)
2. Cynthia L. Radiman Dr.Ing, Prof. (Université Montpellier 2, Sciences et Techniques)  
Polymer Chemistry  
cynthia@chem.itb.ac.id
3. Djulia Onggo Ph.D., Prof. (University of New South Wales)  
Coordination Chemistry  
djulia@chem.itb.ac.id
4. I Made Arcana Dr., Prof. (Université Montpellier 2, Sciences et Techniques)  
Biodegradable Polymers  
arcana@chem.itb.ac.id
5. Achmad Rochliadi Ph.D. (Curtin University, Australia, 2008)  
Electrochemistry, Corrosion and Battery,  
achmad@itb.ac.id
6. Aep Patah Ph.D. (Shibaura Institute of Technology)  
Inorganic Materials and Catalyst  
aep@chem.itb.ac.id
7. Bambang Prijamboedi Dr. (University of Tsukuba)  
Functional Oxide Materials  
boedi@chem.itb.ac.id
8. Barnas Holil Dr.Ing (Université Montpellier 2, Sciences et Techniques)  
Lithography  
barnas@chem.itb.ac.id
9. Bunbun Bundjali Dr. (Institut Teknologi Bandung)  
Corrosion, Surface Electrochemistry  
bunbun@chem.itb.ac.id
10. I Nyoman Marsih Ph.D. (University of Sheffield)  
Heterogeneously Catalyzed Reactions  
nyoman@chem.itb.ac.id
11. Irma Mulyani Ph.D. (University of Sydney)  
Bioinorganic Chemistry  
irma@chem.itb.ac.id
12. Lubna Baradja MS. (Institut Teknologi Bandung)  
Kinetic Theory of Gas  
lubna@chem.itb.ac.id
13. Mia Ledyastuti Dr.Eng (Kyoto University)  
Computational Chemistry
14. Muhamad A. Martoprawiro Ph.D. (University of Sydney)  
Computational Chemistry  
muhamad@chem.itb.ac.id
15. Rachmawati Dr. (University of Groningen)  
Polymer Chemistry
16. Rino Rakhmata Mukti Dr. (Technische Universität München)  
Nanostructured Porous Materials  
rino@chem.itb.ac.id
17. Veinardi Suendo Dr. (École Polytechnique)  
Materials Science and Advanced Characterizations  
vsuendo@chem.itb.ac.id

18. Yessi Permana  
Dr. (University of Tokyo)  
Homogeneous Catalysis  
yessi@chem.itb.ac.id
19. R. Aditya Wibawa Sakti  
MSi. (Institut Teknologi Bandung)  
Theoretical Chemistry  
adit@chem.itb.ac.id

### Grants

1. I Made Arcana. Polimer elektrolit dari limbah kulit udang untuk aplikasi baterai litium. *Hibah Riset KK 2012*.
2. I Made Arcana. Pemanfaatan minyak kelapa sawit untuk pembuatan polimer yang dapat terbiodegradasi (New Biodegradable Polymers). *Hibah Riset Desentralisasi DIKTI 2012*.
3. Ismunandar. BIMEVOX yang disintesis dengan menggunakan teknik liquid-prekursor: Uji kinerja sebagai elektrolit sel bahan bakar padat. *Hibah Riset KK 2012*.
4. Ismunandar. Mengungkap perubahan struktur dalam Aurivillius  $Pb_{1-x}Bi_4+xTi_4-xMn_xO_{15}$  dan  $Pb_{2-x}Bi_4+xTi_5-xMn_xO_{18}$ : studi spektroskopi Raman. *Hibah Riset Desentralisasi DIKTI 2012*.
5. Ismunandar. Electrolytes Bimevox. *British Councils 2012*.
6. Veinardi Suendo. Ice-templating method on the synthesis of nanostructured polyaniline as high conductivity materials in organic electronics. *Hibah Riset KK 2012*.
7. Yessi Permana. Polymerizations of pine trees derived  $\beta$ -pinene using Zr-supported clays: heat resistant polymers from biomass. *Hibah Kerma LN dan Publikasi Internasional Batch I DIKTI 2012*.
8. Cynthia L. Radiman. Sintesis membran komposit nata de coco-Platina(NdC-Pt) sebagai elektroda sel bahan bakar metanol. *Hibah Riset dan Inovasi KK 2013*.

### Publication

1. Hardian, Ismunandar. Synthesis and characterization of gd and er co-doped ceria as solid electrolyte for IT-SOFC via solid state method. *International Conference on Instrumentation, Communication, Information Technology and Biomedical Engineering (ICICI-BME)*. 2011.
2. Kilo A. L., Prijamboedi B., Martoprawiro M. A., Ismunandar. Modeling ionic conduction in  $\gamma$ - $Bi_2VO_5$ . *International Conference on Instrumentation, Communication, Information Technology and Biomedical Engineering (ICICI-BME)*. 2011.
3. Ismunandar, Rusli R., Ramdan H. Temperature dependent study of  $Bi_2V_{1-x}Ga_xO_{5.5}$  ( $x = 0.1$  and  $0.15$ ) oxides. *International Conference on Instrumentation, Communication, Information Technology and Biomedical Engineering (ICICI-BME)*. 2011.
4. Noviyanti A. R., Prijamboedi B., Marsih I. N., Mukti R. R., Ismunandar. Conductivity and solid state  $^{29}Si$  NMR studies of apatite-type lanthanum silicate prepared by hydrothermal. *International Conference on Instrumentation, Communication, Information Technology and Biomedical Engineering (ICICI-BME)*. 2011.
5. Ismunandar, Indartono Y. S. Editorial introduction. Climate change and poverty in Asia: challenges and prospects. *RDD (Regional Development Dialogue)*, **32(2)**: iii-viii. 2011.
6. Setiabudi H. D., Jalil A. A., Triwahyono S., Kamarudin N. H. N., Mukti R. R. IR study of iridium bonded to perturbed silanol groups of Pt-HZSM-5 for n-pentane isomerization. *Applied Catalysis A: General*, **417-418**: 190-199. 2012.
7. Rahmawati F., Prijamboedi B., Soepriyanto S., Ismunandar. SOFC composite electrolyte based on LSGM-8282 and zirconia or doped zirconia (from zircon concentrate). *International Journal of Minerals, Metallurgy, and Material*, **19(9)**: 863-871. 2012.
8. Noviyanti A. R., Prijamboedi B., Marsih I. N., Mukti R. R., Ismunandar. Hydrothermal preparation of apatite-type phases  $La_9.33Si_6O_{26}$  and  $La_9M_1Si_6O_{26.5}$  ( $M = Ca, Sr, Ba$ ). *ITB Journal of Science*, **44A(2)**: 193-203. 2012.

9. Kamarudin N. H. N., Jalil A. A., Triwahyono S., Mukti R. R., Aziz M. A. A., Setiabudi H. D., Muhid M. N. M., Hamdan H. Interaction of Zn<sup>2+</sup> with extraframework aluminum in HBEA zeolite and its role in enhancing n-pentane isomerization. *Applied Catalysis A: General*, **431-432**: 104-112. 2012.
10. Suendo V., Viridi S. Ab initio calculation of UV-Vis absorption spectra of a single chlorophyll *a* molecule: comparison study between RHF/CIS, TDDFT, and semi-empirical methods. *ITB Journal of Science*, **44A(2)**: 93-112. 2012.
11. Sianipar A., Amran M. B., Buchari, Arcana I. M. Effect of degree binary complex of imprint ion on the extraction of zircon ion. *IOSR Journal of Applied Chemistry (IOSRJAC)*, **1(4)**: 15-19. 2012.
12. Gonggo S. T., Radiman C. L., Bundjali B., Arcana I. M. Properties of polymer electrolyte membranes prepared by blending sulfonated polystyrene with lignosulfonate. *ITB Journal of Science*, **44A(3)**: 285-295. 2012.
13. Ramadhan L. O. A. N., Radiman C. L., Suendo V., Wahyuningrum D., Valiyaveetil S. Synthesis and characterization of polyelectrolyte complex N-succinyl chitosan-chitosan for proton exchange membrane. *Procedia Chemistry*, **4**: 114-122. 2012.
14. Suendo V., Minagawa M., Tanioka A. Chronopotentiometry study of a cation-exchange membrane in the presence of cationic surfactant in membrane surface vicinity. *Ionics*, **18**: 159-166. 2012.
15. Zunita M., Wahyuningrum D., Buchari, Bundjali B. Investigation of corrosion inhibition activity of 3-butyl-2,4,5-triphenylimidazole and 3-butyl-2-(2-butoxyphenyl)-4,5-diphenylimidazole toward carbon steel in 1% NaCl solution. *International J. Electrochem. Sci.*, **7(4)**: 3274-3288. 2012.
16. Nurbaiti S., Martoprawiro M. A., Akhmaloka, Hertadi R. The role of electrostatic interactions on Klentaq1 insight for domain separation. *Bioinformatics and Biology Insights 2012*, **6**: 225-234. 2012.
17. Triwahyono S., Jalil A. A., Mukti R. R., Musthofa M., Razali N. A. M., Aziz M. A. A. Hydrogen spillover behavior of Zn/HZSM-5 showing catalytically active protonic acid sites in the isomerization of n-pentane. *Applied Catalysis A: General*, **407**: 91-99. 2011.
18. Wustoni S., Mukti R. R., Wahyudi A., Ismunandar. Sintesis zeolit mordenit dengan bantuan benih mineral alam. *Jurnal Matematika & Sains*, **16(3)**: 158-160. 2011.
19. Mukti R. R., Kamimura Y., Chaikittisilp W., Hirahara H., Shimojima A., Ogura M., Cheralathan K. K., Elangovan S. P., Itabashi K., Okubo T. Hierarchically porous ZSM-5 synthesized by nonionic- and cationic-templating routes and their catalytic activity in liquid-phase esterification. *ITB Journal of Science*, **43A(1)**: 59-72. 2011.
20. Piluharto B., Suendo V., Ciptati, Radiman C.L. Strong correlation between membrane effective fixed charge and proton conductivity in the sulfonated polysulfone cation-exchange membranes. *Ionics*, **17(3)**: 229-238, 2011.
- 21.







# 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 algebraists.





## Members

1. Irawati (Leader) Dr. (ITB) Professor  
*Ring and Module Theory*  
*irawati@math.itb.ac.id*
2. Pudji Astuti Dr. (ANU) Professor  
*Module Theory*  
*pudji@math.itb.ac.id*
3. Ahmad Muchlis Ph.D., (Univ. Wisconsin)  
*Matrix Analysis*  
*muchlis@math.itb.ac.id*
4. Intan Muchtadi Dr. (Univ. Picardie)  
*Representation Theory*  
*intan@math.itb.ac.id*
5. Hanni Garminia Dr. (ITB)  
*Ring and Module Theory*  
*hani@math.itb.ac.id*
6. Aleams Barra Ph.D. (Univ. Kentucky)  
*Algebraic Coding Theory*  
*barra@math.itb.ac.id*
7. Dellavitha Nasution M.Si. (ITB)  
*Geometric Representation Theory (on leave)*
8. Fajar Yulianan M.Si (ITB).  
*Representation Theory*  
*fajar.yulianan@math.itb.ac.id*
9. Gantina Rachmaputri M.Si (ITB)  
*Module Theory*

## Grants

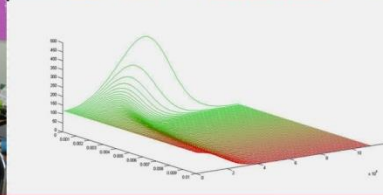
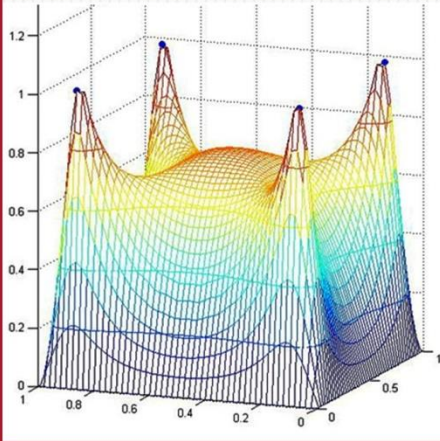
1. Intan Muchtadi-Alamsyah. Sektor Blok dengan Grup Defect Komutatif (On Block with Abelian Defect Group). *Hibah Bersaing Dikti 2012*.
2. Intan Muchtadi-Alamsyah. Accelerating Parallelized Pollard Rho to Identify Weak Class Elliptic Curves. *Asabi Glass Foundation 2012*.
3. Hanni Garminia Y. Karakterisasi Hypergraph Bunga Matahari Integral. *Hibah Riset dan Inovasi KK 2012*.
4. Pudji Astuti Waluyo. Sifat sifat Bentuk Linier terkait dengan Model Rasional di Sekitar Pole Takhingga. *Hibah Riset dan Inovasi KK 2012*.

## Publication

1. Astuti M., Salman A. N. M., Garminia H., Irawati. The Properties of Some Coefficients of the Characteristics and the Laplacian Polynomial of a Hypergraph. *International Journal of Contemporary Mathematical sciences*, **7(21)**: 1029-1035. 2012.
2. Astuti M., Garminia H., Salman A. N. M., Irawati. Integral Complete  $r$ -Uniform Hypergraph and Sunflower Hypergraph. *Far East Journal of Mathematical Sciences*, **65(1)**: 87-96. 2012.
3. Misri M. A., Irawati, Garminia H. Cyclic and Multiplication  $p$ -Bezout Modules. *International Journal of Algebra*, **6(23)**: 1117-1120. 2012.
4. Purboyo T. W., Rahardjo B., Kuspriyanto, Muchtadi-Alamsyah I. A New Metric for Predicting Network Security Level. *Journal of Global Research in Computer Sciences*, **3(3)**: 68-72.
5. Paryasto T. W., Rahardjo B., Yulianan F., Muchtadi-Alamsyah I. Composite Field Multiplier Based on Look-Up Table for Elliptic Curve Cryptography Implementation. *ITB Journal of Information and Communication Technology*, **6(1)**: 63-81. 2012.
6. Darmajid, Muchtadi-Alamsyah I., Irawati. The Degenerations for Modules and Dual Modules. *JP Journal of Algebra number Theory and Applications*, **26(1)**: 65-73. 2012.



7. Santika A. P., Muchtadi-Alamsyah I. The Regular Subspaces of Symetric Nakayama Algebras and Algebras of Dihedral and Semidihedral Type. *JP Journal of Algebra Number Theory and Applications*, **27(2)**: 131-142. 2012.
8. Darmajid, Muchtadi-Alamsyah I., Irawati. Polydule Varieties Over Finite Dimensional Algebras. *Proceeding International Conference on Mathematics, Statistics and Applications*. 2012.
9. Irwansyah, Muchlis A., Suprijanto D., Muchtadi-Alamsyah I., On Almost Weakly Self-Dual Normal Bases. *Proceeding International Conference on Mathematics, Statistics and Applications*. 2012.
10. Muchtadi-Alamsyah I. Pollard Rho Algorithm for Elliptic Curves Over Compositte Fields. *Proceeding International Conference on Mathematics, Statistics and Applications*. 2012.
11. Maris I. M., Kariman D., Risnawita, Muchtadi-Alamsyah I. A Note on the Dual of Some Special Biserial Algebra in Advances in Algebra Structures. *World Scientific*, 414-417. 2012.
12. Muchtadi-Alamsyah I., Yuliawan F., Muchlis A. Finite Field Basis Conversion and Normal Basis in Characteristic Three in Advances in Algebra Structures. *World Scientific*, 439-447. 2012.
13. Darmajid, Muchtadi-Alamsyah I. The Geometric Representation of Semisimple Modeule. *Proceeding 2<sup>nd</sup> Basic Sciences International Conference*. 2012.
14. Santika A. P. Grup Defect pada Grup PSL(2,3) dan PSL(2,5). *Journal Matematika dan Sains ITB*, 19-21. 2012.
15. Nopendri, Yuliawan F. Algoritma Perluasan Euclid pada Lapangan Komposit  $GF((p^n)^m)$ . *Prosiding Seminar Nasional Aljabar*, 130-135. 2012.



# 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.



## Members

1. Wono Setya Budhi, (Leader) Ph.D. (Univ. Illinois)  
*Inverse Problems*  
*wono@math.itb.ac.id*
2. Hendra Gunawan Professor , Ph.D. (UNSW)  
*Fourier & Functional Analysis*  
*hgunawan@math.itb.ac.id*
3. Jalina Widjaja Ph.D., (Univ. Adelaide)  
*Delay Equations*  
*jalina@math.itb.ac.id*
4. Janny Lindiarni Ph.D. (Univ. Newcastle)  
*Operator Algebra*  
*janny@math.itb.ac.id*
5. Johan Matheus Tuwankotta Dr. ( Univ. Utrecht)  
*Dynamical Systems*  
*theo@math.itb.ac.id*
6. Koko Martono M.Si. (ITB)  
*Real Analysis*  
*kmrt@math.itb.ac.id*
7. Yudi Soeharyadi Ph.D. (Univ. Memphis)  
*Partial Differential Equations*  
*yudish@math.itb.ac.id*
8. Oki Neswan Ph.D. (Iowa Univ.)  
*Model Theory*  
*oneswan@math.itb.ac.id*
9. Eric Haryanto M.Si (ITB)  
*Dynamical Systems*

## Grants

Hendra Gunawan. Identifikasi Ruang Dual dari Ruang Normn ( $\ell^p$ ,  $|\cdot|, \dots, \cdot$ ). *Hibab Riset dan Inovasi KK 2012*.

## Publication

1. Sitompul P., Gunawan H., Soeharyadi Y., Gunawan A. Y. An energy Investigation of Reaction Diffusion Equations. *AIP Conf. Proc.*, **1450**: 363-367. 2012.
2. Nurhayat N., Pasaribu U. S., Neswan O. Application of Generalized Space-Time Autoregressive Model on GDP Data in West European Countries. *Journal of Probability and Statistics*. 2012.
3. Budi W. S. Another Elementary Proof of Jordan Decomposition for a matrix. *AIP Conference Proceedings*, **1450**. 2012.
4. Gunawan H., Nakai E., Sawono Y., Tanaka H. Generalized Stummel Class and Morrey Spaces. *PIB 92*. 2012.
5. Tanaka H., Gunawan H. The Local Trace Inequality for Potential Type Integral Operators. *POTA*. 2012.
6. Sihwaningrum I., Maryani S., Gunawan H. Weak-Type Inequalities for Fractional Integrals Operators on Generalized Non-Homogeneous Morrey Spaces. *ATA*, **28**: 65-67. 2012.
7. Eridani, Gunawan H., Utoyo M. I. A Revisit on Nakai's Results on Fractional Integrals and Maximal Functions. *ATA*, **28**: 263-267. 2012.
8. Pangalela Y. E. P., Gunawan H. Representasi Fungsional-2 di Ip. *JMP Edisi Khusus Simposium Nasional Analisis Matematika dan Aplikasinya V*. 2012.
9. Hakim D. I., Gunawan H., Ketaksamaan Hermite-Hadamard terhadap Integral Riemann-Stieltjes. *JMP Edisi Khusus Simposiu Nasional Analisis Matematika dan Aplikasinya V*. 2012.
10. Ekariani S., Gunawan H. Teorema Titik Tetap Pada Ruang Nor-n Standart. *JMP Edisi Khusus Sipsosiu Nasional Analisis Matematika dan Aplikasinya V*. 2012.
11. Pangeran B.H.P., Gunawan H. Ketaksamaan Chebyshev dan Perumumannya. *JMP Edisi Khusus Simposium Nasional Analisis Matematika dan Aplikasinya V*. 2012.





12. Hamzah D. A., Gunawan H. Aproksimasi Polinomial Minimaks Berderajat Satu dengan Menggunakan Metode Jajargenjang Terkecil. *Prosiding Konferensi Nasional Matematika XV*. 2012.