



SOUTH EAST ASIAN MATHEMATICAL SOCIETY

SEAMS SCHOOL PROPOSAL

Module Theory and Its Applications

Institut Teknologi Bandung
10-18 November 2014

Organized by

Algebra Research Group, Institut Teknologi Bandung
Indonesian Algebra Society

2014

SEAMS SCHOOL PROPOSAL

1. The proposed title, place and dates of the SEAMS School

Title of the SEAMS School	:	Module Theory and Its Applications
Place	:	Institut Teknologi Bandung
Dates	:	10-18 November 2014

2. Organizers (write the names, place of work, and email address, if you have more than two then add the necessary lines)

1. Name	:	Intan Muchtadi
Institution	:	Institut Teknologi Bandung
Email and Phone	:	ntan@math.itb.ac.id
2. Name	:	Hanni Garminia
Institution	:	Institut Teknologi Bandung
Email and Phone	:	garminia@math.itb.ac.id

3. Short Description of the Scientific Content (max 100 words)

<p>The aim of this School is to introduce the students to the fundamental theories and research in Module Theory. Its applications in coding theory is also explored. The school will focus on the following courses :</p> <ol style="list-style-type: none">1. Introduction to Module Theory, Speakers : Sri Wahyuni, Irawati2. Primeness in Module Category, Speakers : Nguyen Van Sanh, Indah Emilia Wijayanti3. Module Representations, Speaker : Dellavitha Nasution, Intan Muchtadi

4. Introduction to Coding Theory over Finite Modules, Speaker : Aleams Barra

4. The speakers of the school (names, address, emails)

1. Dr. Nguyen Van Sanh, Mahidol University, Thailand, nguyen.san@mahidol.ac.th
2. Prof. Dr. Irawati, ITB, irawati@math.itb.ac.id
3. Prof. Dr. Sri Wahyuni, UGM, swahyuni.maruf@gmail.com
4. Dr. Indah E. Wijayanti, UGM, ind_wijayanti@yahoo.com
5. Dr. Aleams Barra, ITB, barra@math.itb.ac.id
6. Dr. Dellavitha Nasution, ITB, dellavitha@math.itb.ac.id
7. Dr. Intan Muchtadi, ITB, ntan@math.itb.ac.id

5. Describe in a few lines the local institution related to this school, including the main academic program and its strength. Give also the Internet site of the local institutions.

The Algebra Research Group ITB is one of the 15 research groups in Faculty of Mathematics and Natural Sciences ITB.

The Research Program of Algebra Research Group ITB covers the fundamental research with emphasis on the development of the Theory of Module and Linear Algebra; including research in Module Theory with categorical approach and of algebraic structure related to Control System Theory. The Research Program also covers the application of algebraic structures in Cryptography, Coding Theory and other areas.

In Undergraduate Program in Mathematics we are responsible for teaching Elementary Linear Algebra, Structures of Ring Integers, Linear Algebra, Algebraic Structures, Capita Selecta in Algebra.

In Master Program in Mathematics we are responsible for teaching Matrix Analysis, Advanced Linear Algebra, Advanced Algebraic Structures, Modul Theory, Group Theory and Topics in Algebra.

The group members are actively working in research on the following areas :

- Research on algebras, modules, coalgebras, and comodules : hereditary, cohereditary, Noether, coNoether, prime, coprime and Dedekind properties.
- Research on linear algebra : characteristic and hyperinvariant

subspaces, algebraic structures related to Algebraic Control Theory

- Research on module theory with categorical approach : abelian, triangulated and derived categories
- Research on algebraic structures and their applications in Coding Theory and Cryptography, Geomodelling, etc.

website : <http://algebra.math.itb.ac.id>

6. Provide information about the expected participants. The number and the distribution of expected participants.

We expect about 30 undergraduate and master students, and young mathematicians from Indonesia, including 10 participants from other Asian countries.

7. Describe the objectives and the program of the proposed school, including the courses, speakers, abstracts (8 lines each) and tentative schedules for each course.

Objectives of the School

1. To introduce students to the fundamental theories and research in Module Theory and its applications in coding theory;
2. To provide young researchers with sufficient knowledge and background to start their research in Module Theory.
3. To facilitate contacts between mathematicians working in these areas and the students coming to the School.

The School will introduce students to module theory and its applications. The school will stimulate a good research atmosphere in Indonesia in particular. Such a school can also stimulate an improvement of the quality of our undergraduate and master programs. This is because of the involvement of undergraduate and master students in this school will be high. This school facilitates an opportunity to meet outstanding speakers/researchers from other countries. This opportunity is very rare and expensive to happen in Indonesia. This opportunity is very likely to induce further and new directions of research. Several natural new linkages and cooperation will occur.

The school will focus on the following courses :

1. An Introduction to Module Theory, Speakers : Sri Wahyuni, Irawati
2. Primeness in Module Category, Speakers : Nguyen Van Sanh, Indah Emilia Wijayanti
3. Module Representations, Speaker : Intan Muchtadi, Dellavitha Nasution
4. Introduction to Coding Theory over Finite Modules, Speaker : Aleams Barra

Speakers :

1. Dr. Nguyen Van Sanh, Mahidol University, Thailand, nguyen.san@mahidol.ac.th
2. Prof. Dr. Irawati, ITB, irawati@math.itb.ac.id
3. Prof. Dr. Sri Wahyuni, UGM, swahyuni.maruf@gmail.com
4. Dr. Indah E. Wijayanti, UGM, ind_wijayanti@yahoo.com
5. Dr. Aleams Barra, ITB, barra@math.itb.ac.id
6. Dr. Dellavitha Nasution, ITB, dellavitha@math.itb.ac.id
7. Dr. Intan Muchtadi, ITB, ntan@math.itb.ac.id

Abstract :

1. An Introduction to Module Theory

Modules are generalization of vector spaces. Moreover, an abelian group is a module over the ring of integers, while a matrix with entries in

a field F defines a module over the polynomial ring $F[x]$. This course covers the introduction to modules as generalization of vector spaces. Some properties of vector spaces will be studied in module cases. Course content : structures and properties of modules, free modules, modules over Euclidean domains, completely reducible modules, projective modules.

2. Primeness in Module Category

In the first part of this course we introduce the notion of prime submodules of a given right R -module and describe all properties of them as a generalization of prime ideals in rings. Course content : prime submodules, semiprime submodules, prime modules, semiprime modules, prime radicals.

In the second part of this course we will cover the dual of prime conditions. Course content : prime and coprime modules, prime and coprime comodules, fully prime and coprime modules.

3. Module Representations

Let K be an algebraically close field. To a basic, connected, finite dimensional K -algebra A , we associate a bound quiver (Q, I) . In this course we will explain how any A -module M can be represented as K -linear representation of (Q, I) , which is a family of K -vector spaces M_a , for all vertices in Q_0 , connected by K -linear maps f_s from M_a to M_b corresponding to arrows s from a to b in Q , and satisfying some relations induced by I . This course will also cover representation of projectives, injectives and simple modules.

4. Introduction to Coding Theory over Finite Modules

Coding theory is traditionally studied where the alphabet for the codewords is a field. The ground breaking result of Hammons et. al. (1994) showed that some important class of nonlinear codes, namely the Kerdock and Preparata codes can be viewed as codes where the alphabet is the ring Z_4 . Since then, coding theory over finite rings was studied extensively by many authors. One of the important results in coding theory is the MacWilliams extension theorem. In generalizing the field to a ring, one wish to preserve several nice results in coding theory over fields. One of the desired results is the MacWilliams extension theorem. Wood showed that for codes over finite rings, the MacWilliam extension theorem holds true if and only if the ring is Frobenius. The next natural generalization is to change the alphabet to module. The course will give an introduction to coding theory over finite modules. The focus will be on finding the right class of modules to work with and show that in this class of modules the MacWilliams extension theorem still holds true.

Hour	Sun, 9	Mon, 10	Tue, 11	Wed, 12	Thu, 13
08.00-08.15	arrival	Opening program			
08.15 - 09.15		ITM1	ITM 4	PM 2	PM 3
09.15 - 10.00					
10.00 - 10.30		break	break	break	break
10.30 - 11.30		ITM2	PM 1	MR 1	PM 4
11.30 - 12.00					
12.00 - 13.00		Lunch	Lunch	Lunch	Lunch
13.00 - 13.30		ITM 3	ITM 5	MR 2	PM 5
13.30 - 14.45					
14.45 - 15.15		break	break		break
15.15 - 16.15		Group discussion	Group discussion		Group discussion
16.15 - 17.15					

Hour	Fri, 14	Sat, 15	Sun, 16	Mon, 17	Tue, 18	
08.15 - 09.15	MC 1	excursion		MC 3	MR 5	
09.15 - 09.30						
09.30 - 10.00	break					
10.00 - 10.30	MC 2				BREAK	BREAK
10.30- 11.30					MC 4	MC 5
11.30 - 12.00	Lunch					

12.00 - 13.00				Lunch	Lunch
13.00 - 13.30	MR 3			MR 4	closing
13.30 - 14.15					
14.15 - 14.45	break			break	
14.45 - 15.45	Group			Group	
15.45 - 16.45	discussion			discussion	

ITM : Introduction to Module Theory, Speakers : Sri Wahyuni, Irawati

PM : Primeness in Module Category, Speakers : Nguyen Van Sanh, Indah Wijayanti

MR : Module Representations, Speaker : Dellavitha Nasution, Intan Muchtadi

MC : Module Theory in Coding Theory, Speaker : Aleams Barra

8. Provide information about provisional budget and the expected funding.

NO	ITEM	TOTAL (euros)
1	TICKETS	
	Overseas Students : 10 persons	3400
	Overseas speaker 1 person (Nguyen Van Sanh)	340
	Indonesian speakers 2 Indonesian speakers from other city	175
2	ACCOMMODATION	
	Overseas students 10 persons- 9 days	1969
	Speakers 1 person - 9 days	197
	Indonesian speakers 2 Indonesian speakers form other city	394
3	FOOD EXPENSES	
	Lunch + 2 snacks during school : 7 days	985
	school dinner	188
	lunch and snack during tour	140
4	LOCAL TRANSPORT	
	Jakarta-Bandung 11 persons @Rp 500000	344
	Coaster rental for tour 1 day	94
5	SUPPLIES AND PRINTINGS	
	Program, lecture notes and Kits	94
6	SECRETARIAT AND LOCAL COMMITTEE EXPENSES	180
	TOTAL	8500
Funding Distribution		
No	ITEM	TOTAL (euros)
1	CIMPA	4500
2	Faculty of Mathematics and Natural Sciences ITB	800

3	IMU	1600
4	ICTP	1600
	TOTAL	8500

9. Provide CVs for the organizers.

DR. INTAN MUCHTADI-ALAMSYAH
ASSOCIATE PROFESSOR

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FACULTY OF MATHEMATICS AND NATURAL SCIENCES,
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EDUCATION:

DOCTOR OF MATHEMATICS, UNIVERSITY OF PICARDIE, FRANCE, APRIL 2004
DIPLOME D'ETUDES APPROFONDIES (DEA), UNIVERSITY OF PICARDIE, FRANCE,
JUNE 2001
MASTER OF SCIENCE (M.Sc.), MATHEMATICS
DEPARTMENT, INSTITUT TEKNOLOGI BANDUNG (ITB), INDONESIA, OCTOBER 1999
BACHELOR OF SCIENCE (B.Sc.), MATHEMATICS
DEPARTMENT, INSTITUT TEKNOLOGI BANDUNG (ITB), INDONESIA, OCTOBER 1997

PUBLICATION

INTERNATIONAL JOURNALS

PUBLICATION IN REPRESENTATION THEORY:

1. DARMAJID AND I. MUCHTADI-ALAMSYAH, *OPEN CONDITION ON VARIETY OF COMPLEXES*, EAST WEST JOURNAL OF MATHEMATICS, **vol 15** No 1 (2013) 37-42.
2. FAISAL, IRAWATI AND I.MUCHTADI-ALAMSYAH, *AUSLANDER-REITEN QUIVER OF NAKAYAMA ALGEBRA TYPE DYNKIN GRAPH A_n* , JOURNAL OF MATHEMATICAL AND FUNDAMENTAL SCIENCES, **vol 45** No 1 (2013) 1-16.
3. DARMAJID, I.MUCHTADI-ALAMSYAH AND IRAWATI, *THE DEGENERATIONS FOR MODULES AND DUAL MODULES*, JP JOURNAL OF ALGEBRA NUMBER THEORY AND APPLICATIONS **vol. 26** ISSUE 1 (2012) 65-73.
4. A.P. SANTIKA AND I. MUCHTADI-ALAMSYAH, *THE P-REGULAR SUBSPACES OF SYMMETRIC NAKAYAMA ALGEBRAS AND ALGEBRAS OF DIHEDRAL AND SEMIDIHEDRAL TYPE*, JP JOURNAL OF ALGEBRA NUMBER THEORY AND APPLICATIONS **vol.27** NUMBER 2 (2012), 131-142.
5. I.MUCHTADI-ALAMSYAH AND H. GARMINIA, *QUIVER OF BOUNDED PATH ALGEBRAS AND BOUNDED PATH COALGEBRAS*, ITB J. Sci. **Vol. 42 A**, No. 2 (2010) 153-162
6. I.MUCHTADI-ALAMSYAH, *BRAID ACTION ON DERIVED CATEGORY OF NAKAYAMA ALGEBRAS*, COMMUNICATION IN ALGEBRA **vol. 36** ISSUE 07 (2008) 2455-2569.
7. I. MUCHTADI-ALAMSYAH, *HOMOMORPHISMS OF COMPLEXES VIA HOMOLOGIES*, JOURNAL OF ALGEBRA **294** (2005) 321-345.

PUBLICATION IN RING THEORY:

1. H. MARUBAYASHI, I. MUCHTADI-ALAMSYAH AND A. UEDA, *SKREW POLYNOMIAL RINGS WHICH ARE GENERALIZED ASANO PRIME RINGS*, JOURNAL OF ALGEBRA AND ITS APPLICATIONS VOL 12 ISSUE 7 (2013).
2. E. SUWASTIKA, I. MUCHTADI-ALAMSYAH AND IRAWATI, *POLYNOMIALS OVER G-DEDEKIND PRIME RINGS*, FAR EAST JOURNAL OF MATHEMATICAL SCIENCES, **Vol 58** ISSUE 2 (2011) 173-178.
3. A.K.AMIR, P.ASTUTI, I. MUCHTADI-ALAMSYAH AND IRAWATI, *ON MAXIMAL ORDERS AND FACTOR RINGS OF ORE EXTENSION OVER A COMMUTATIVE DEDEKIND DOMAIN*, FAR EAST JOURNAL OF MATHEMATICAL SCIENCES, **Vol 55** ISSUE 1 (2011) 21-30
4. A.K. AMIR, H. MARUBAYASHI, P. ASTUTI AND I. MUCHTADI-ALAMSYAH, *CORRIGENDUM TO MINIMAL PRIME IDEALS OF ORE EXTENSION OVER A COMMUTATIVE DEDEKIND DOMAIN AND ITS APPLICATION*, JP JOURNAL OF ALGEBRA, NUMBER THEORY AND APPLICATIONS, **Vol 21** ISSUE 1 (2011) 41-44.
5. A.K.AMIR, P.ASTUTI AND I. MUCHTADI-ALAMSYAH, *MINIMAL PRIME IDEAL OF ORE OVER COMMUTATIVE DEDEKIND DOMAINS*, JP JOURNAL OF ALGEBRA, NUMBER THEORY AND APPLICATIONS, **vol.16** no.2 (2010) 101-107.

PUBLICATION IN APPLIED ALGEBRA/ CRYPTOGRAPHY:

1. I. MUCHTADI-ALAMSYAH, T. ARDIANSYAH, S.S. CARITA, *POLLARD RHO ALGORITHM FOR ELLIPTIC CURVES OVER $GF(2^N)$ WITH NEGATION AND FROBENIUS MAP*, ADVANCED SCIENCE LETTERS **20**(2014), 340-343.
2. I. MUCHTADI-ALAMSYAH, T. ARDIANSYAH, S.S. CARITA, *POLLARD RHO ALGORITHM FOR ELLIPTIC CURVES OVER $GF(2^N)$ WITH NEGATION MAP, FROBENIUS MAP AND NORMAL BASIS*, FAR EAST JOURNAL OF MATHEMATICAL SCIENCES, SPECIAL VOLUME, ISSUE IV, (2013) 385-402.
3. I.MUCHTADI-ALAMSYAH AND F.YULIAWAN, *BASIS CONVERSION IN COMPOSITE FIELD*, INTERNATIONAL JOURNAL OF MATHEMATICS AND COMPUTATION **vol 16** ISSUE 2 (2013) 11-17.
4. M. W. PARYASTO, B. RAHARDJO, F. YULIAWAN, I. MUCHTADI-ALAMSYAH AND KUSPRIYANTO, *COMPOSITE FIELD MULTIPLIER BASED ON LOOK-UP TABLE FOR ELLIPTIC CURVE CRYPTOGRAPHY IMPLEMENTATION*, ITB JOURNAL OF INFORMATION AND COMMUNICATION TECHNOLOGY **Vol 6** no 1 (2012) 63-81.
5. T.W.PURBOYO, B.RAHARDJO, KUSPRIYANTO AND I. MUCHTADI-ALAMSYAH, *A NEW METRIC FOR PREDICTING NETWORK SECURITY LEVEL*, JOURNAL OF GLOBAL RESEARCH IN COMPUTER SCIENCES, **Vol 3** No 3 (2012) 68-72.
6. I. MUCHTADI-ALAMSYAH, A. MUCHLIS AND F.YULIAWAN, *CONSTRUCTING TWISTED ANOMALOUS ELLIPTIC CURVES*, INTERNATIONAL JOURNAL OF BASIC AND APPLIED SCIENCES **Vol 10** ISSUE 6 (2010) 01-04.
7. M.ASTUTI, IRAWATI, I. MUCHTADI-ALAMSYAH, A.MUCHLIS, A.AKBAR, *USING THE ALGEBRA OF HYPERGRAPHS FOR THE RECONSTRUCTION OF PHYLOGENETIC TREES*, INTERNATIONAL JOURNAL OF TOMOGRAPHY AND STATISTICS **vol 12** no F09 (2009) 105-110.

PROCEEDING OF INTERNATIONAL CONFERENCE

PUBLICATION IN REPRESENTATION THEORY

1. FAISAL, I. MUCHTADI-ALAMSYAH, *ON CYCLIC NAKAYAMA M-CLUSTER TILTED ALGEBRA OF TYPE A_n* , PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICAL RESEARCH, EDUCATION AND APPLICATIONS, HO CHI MINH CITY, 2013, 119-127.
2. DARMAJID, I. MUCHTADI-ALAMSYAH AND IRAWATI, *POLYDULE VARIETIES OVER FINITE-DIMENSIONAL ALGEBRAS*, PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICS, STATISTICS AND APPLICATIONS, 2012, PM5.
3. I.M. MARIS, D. KARIMAN, RISNAWITA AND I. MUCHTADI-ALAMSYAH, *A NOTE ON THE DUAL OF SOME SPECIAL BISERIAL ALGEBRAS* IN ADVANCES IN ALGEBRAIC STRUCTURES, PROCEEDING INTERNATIONAL CONFERENCE IN ALGEBRA 2010, WORLD SCIENTIFIC, 2012, 414-417
4. DARMAJID AND I. MUCHTADI-ALAMSYAH, *THE GEOMETRIC REPRESENTATION OF SEMISIMPLE MODULE*, PROCEEDINGS 2ND BASIC SCIENCE INTERNATIONAL CONFERENCE 2012, M1-M4.

5. I. MUCHTADI-ALAMSYAH, *RESEARCH ON NAKAYAMA ALGEBRAS*, PROCEEDING SEAMS-GMU INTERNATIONAL CONFERENCE ON MATHEMATICS AND ITS APPLICATIONS, 2011 (INVITED SPEAKER), 41-50.
6. DARMAJID AND I. MUCHTADI-ALAMSYAH, *DEGENERATIONS FOR FINITE DIMENSIONAL REPRESENTATIONS OF QUIVERS*, PROCEEDING SEAMS-GMU INTERNATIONAL CONFERENCE ON MATHEMATICS AND ITS APPLICATIONS, 2011, 137-144.
7. I. MUCHTADI-ALAMSYAH AND H. GARMINIA, *QUIVER OF PATH ALGEBRAS AND PATH COALGEBRAS*, PROCEEDING INDOMS INTERNATIONAL CONFERENCE ON MATHEMATICS AND ITS APPLICATIONS, 2009, PP. 0023-0028.
8. I. MUCHTADI-ALAMSYAH, *ALGEBRAS AND QUIVERS*, PROCEEDING OF ISSM, PARIS, 2005
9. I. MUCHTADI-ALAMSYAH, *ON DERIVED EQUIVALENCE OF GROUP RINGS*, PROCEEDING ISSM 2003, P.9-12 ISSN 0885-8692, DELFT, NETHERLANDS.
10. I. MUCHTADI-ALAMSYAH, *LINKING SOCCER BALLS AND PYRAMIDS BY DERIVED EQUIVALENCE*, PROCEEDING PUBSCI AEIF VOL. 1 NO 3, 2002, 121-126, ISSN 1626-6447

PUBLICATION IN RING THEORY:

1. E. SUWASTIKA AND I. MUCHTADI-ALAMSYAH, *GENERALIZED DEDEKIND MODULES*, PROCEEDING 3RD BASIC SCIENCE INTERNATIONAL CONFERENCE 2013, BRAWIJAYA UNIVERSITY, MALANG, APRIL 2013.
2. M.R. HELMI AND I. MUCHTADI-ALAMSYAH, *POLYNOMIALS OVER DEDEKIND DOMAINS*, PROCEEDING INDOMS INTERNATIONAL CONFERENCE ON MATHEMATICS AND ITS APPLICATIONS, 2009, 0061-0068.
3. I. MUCHTADI-ALAMSYAH, *DUBROVIN VALUATION RINGS OF SKEW POLYNOMIAL RINGS*, PROCEEDING 3RD INTERNATIONAL CONF ON MATHS AND STATISTICS, BOGOR, 2008, 435-437.
4. A.K. AMIR AND P. ASTUTI, I. MUCHTADI-ALAMSYAH, *AROUND PRIME AND MAXIMAL IDEAL OF SKEW POLYNOMIAL RING OVER DEDEKIND DOMAIN*, PROCEEDING 3RD INTERNATIONAL CONF ON MATHS AND STATISTICS, BOGOR, 2008, 169-171.

PUBLICATION IN APPLIED ALGEBRA/ CRYPTOGRAPHY:

1. B. RAHARDJO, I. MUCHTADI-ALAMSYAH, M. PARYASTO, *NOISE BASED STEGO ECC*, PROCEEDING INTERNATIONAL CONFERENCE ON ADVANCE SCIENCE AND CONTEMPORARY ENGINEERING, BINUS UNIVERSITY, OKTOBER 2013
2. IRWANSYAH, A. MUCHLIS, I. MUCHTADI-ALAMSYAH, D. SUPRIJANTO, A. BARRA, *CONSTRUCTION OF WEAKLY SELF DUAL NORMAL BASIS AND ITS APPLICATION IN ORTHOGONAL TRANSFORM ENCODING CYCLIC CODES*, PROCEEDING INTERNATIONAL CONFERENCE ON ADVANCE SCIENCE AND CONTEMPORARY ENGINEERING, BINUS UNIVERSITY, OKTOBER 2013
3. IRWANSYAH, A. MUCHLIS, D. SUPRIJANTO AND I. MUCHTADI-ALAMSYAH, *ON ALMOST WEAKLY SELF-DUAL NORMAL BASES*, PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICS, STATISTICS AND APPLICATIONS, 2012, PM9

4. I. MUCHTADI-ALAMSYAH, *POLLARD RHO ALGORITHM FOR ELLIPTIC CURVES OVER COMPOSITE FIELDS*, PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICS STATISTICS AND APPLICATIONS, 2012, PM10
5. I. MUCHTADI-ALAMSYAH, F. YULIAWAN AND A. MUCHLIS, *FINITE FIELD BASIS CONVERSION AND NORMAL BASIS IN CHARACTERISTIC THREE* IN ADVANCES IN ALGEBRAIC STRUCTURES, PROCEEDING INTERNATIONAL CONFERENCE IN ALGEBRA 2010, WORLD SCIENTIFIC, 2012, 439-447.
6. M. PARYASTO, B. RAHARDJO, F. YULIAWAN, I. MUCHTADI-ALAMSYAH AND KUSPRIYANTO, *COMPOSITE FIELD MULTIPLIER BASED ON LOOK-UP TABLE FOR ELLIPTIC CURVE CRYPTOGRAPHY IMPLEMENTATION*, PROCEEDING INTERNATIONAL CONFERENCE ON ELECTRICAL ENGINEERING AND INFORMATICS, VOL 2, 890-893, 2011.
7. I. MUCHTADI-ALAMSYAH, ALGEBRAIC STRUCTURES IN CRYPTOGRAPHY, PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICS AND SCIENCES (KEYNOTE SPEAKER), 2011.
8. I. MUCHTADI-ALAMSYAH AND A. ALAMSYAH, ON RIJNDAEL CRYPTOGRAPHY USING BASIS CONVERSION, PROCEEDING CONFERENCE ON KNOWLEDGE INTEGRATION IN ICT 2010, JUNE 2010, PUTRAJAYA MALAYSIA, 333-340.
9. I. MUCHTADI-ALAMSYAH, M. PARYASTO AND M.H. KHUSYAIRI, FINITE FIELD BASIS CONVERSION, PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICS, STATISTICS AND THEIR APPLICATIONS, BUKITTINGGI, JUNE 2009, 15-18
10. I. MUCHTADI-ALAMSYAH AND A. MUCHLIS, ELLIPTIC CURVES CRYPTOSYSTEM VIA TOTALLY NON-MAXIMAL IMAGINARY QUADRATIC ORDERS, PROCEEDING INTERNATIONAL CONFERENCE ON MATHEMATICS AND NATURAL SCIENCES, BANDUNG 28-30 OCTOBER 2008

INVITED SPEAKER :

- “ON CYCLIC NAKAYAMA M-CLUSTER TILTED ALGEBRAS”, INTERNATIONAL CONFERENCE ON MATHEMATICAL RESEARCH, EDUCATION AND EDUCATION, HO CHI MINH CITY VIETNAM, 21-23 DECEMBER 2013
- “INCIDENCE MATRIX”, INVITED LECTURER AT SEAMS SCHOOL ON NUMBERS, MATRICES AND GRAPHS, ITB 4-16 NOVEMBER 2013
- “RESEARCH COLLABORATION WITH UNDERGRADUATE STUDENTS” UGM 26 OCTOBER 2013
- “ON NAKAYAMA M-CLUSTER TILTED ALGEBRAS,” AS INVITED SPEAKER AT
 - SEMINAIRE DE THEORIE DE GROUPE LAMFA, UNIVERSITE DE PICARDIE, FRANCE, 18 SEPTEMBER 2013.
 - SEMINAIRE ALGEBRE, DYNAMIQUE ET TOPOLOGIE, UNIVERSITE AIX MARSEILLE, 23 SEPTEMBER 2013
- “GENERALIZED DEDEKIND MODULES,” INTERNATIONAL CONFERENCE ON MATHEMATICS AND APPLICATIONS- MAHIDOL UNIVERSITY, BANGKOK, 19-21 JANUARY 2013.
- “WHY DO WE NEED LINEAR ALGEBRA,” UPM VISIT TO ITB, 14 NOVEMBER 2012

- “ALGEBRAIC STRUCTURES IN CRYPTOGRAPHY” (KEYNOTE SPEAKER) INTERNATIONAL CONFERENCE ON MATHEMATICS AND SCIENCES, SURABAYA 13 OCTOBER 2011.
- “RESEARCH ON NAKAYAMA ALGEBRAS”, SEAMS-GMU INTERNATIONAL CONFERENCE ON MATHEMATICS AND ITS APPLICATIONS, JOGJAKARTA 12-15 JULY 2011.
- “UNDERGRADUATE AND GRADUATE ALGEBRA COURSE CONTENT AT ITB,“ RESEARCH WORKSHOP ON ALGEBRA AND DISCUSSION ON UNDERGRADUATE AND GRADUATE ALGEBRA COURSES CONTENT UGM JOGJAKARTA 8-9 AUGUST 2009.
- “QUIVER SEBAGAI REPRESENTASI ALJABAR”, SEMINAR NASIONAL ALJABAR, P ENGAJARAN, DAN TERAPANNYA, JOGJAKARTA, 31 JANUARY 2009.
- “PEMBELAJARAN MATEMATIKA BERMAKNA,” SEKOLAH MADANIA PARUNG, 30 JANUARY 2008.
- “BRAID GROUP ACTION ON DERIVED CATEGORY OF NAKAYAMA ALGEBRAS”, AS INVITED SPEAKER AT :
 - [RESEARCHSEMINAR](#), MATHEMATISCHES INSTITUT, UNIVERSITÄT ZU KÖ LN, GERMANY, 15 FEBRUARY 2006.
 - [ALGEBRASEMINAR](#), DEPARTMENT OF MATHEMATICAL SCIENCES NTNU, NORWAY 20 SEPTEMBER 2005.
 - [ARTIN MEETING](#), UNIVERSITY OF EDINBURGH, 1-2 JULY 2005.
 - [THE LEICESTER PURE MATHEMATICS COLLOQUIUM](#), UNIVERSITY OF LEICESTER, 13 JUNE 2005.
 - [7TH ANNUAL POSTGRADUATE GROUP THEORY CONFERENCE](#), UNIVERSITY OF NEWCASTLE UPON TYNE, 30 MARCH - 1 APRIL 2005.

AWARD:

PRIX MAHAR SCHUTZENBERGER FROM THE AFIDES (THE ASSOCIATION FRANCO-INDONESIAN FOR DEVELOPMENT OF SCIENCES), JUNE 2004.

SATYA LENCANA KARYA SAPTA 10 YEARS FROM INDONESIAN GOVERNMENT, AUGUST 2012

SCIENTIFIC ORGANIZATION

- MAIN ORGANIZER, WORKSHOP PENGAJARAN ALJABAR, ITB 29-30 JULI 2011
- CO-ORGANIZE WITH ALEXANDER ZIMMERMANN, CIMPA SCHOOL “GEOMETRIC REPRESENTATION THEORY”, ITB 1-12 AUGUST 2011.
- MEMBER OF ORGANIZING COMMITTEE OF “THE INTERNATIONAL CONFERENCE ON RESEARCH AND EDUCATION IN MATHEMATICS”, ITB 22-24 OCTOBER 2011
- MEMBER OF ORGANIZING COMMITTEE OF “THE INTERNATIONAL CONFERENCE ON MATHEMATICS AND NATURAL SCIENCES”, ITB NOVEMBER 2012

SCIENTIFIC MEMBERSHIP

- MEMBER OF EUROPEAN MATHEMATICS SOCIETY
- MEMBER OF AMERICAN MATHEMATICS SOCIETY

- MEMBER OF INDONESIAN MATHEMATICS SOCIETY
- SECRETARY OF SOUTH EAST ASIA MATHEMATICS SOCIETY
- HEAD OF INDONESIAN ALGEBRA SOCIETY (HIMPUNAN PEMINAT ALJABAR)

REVIEWER/EDITORIAL BOARD

- REVIEWER OF ZENTRALBLATT MATH REVIEW
- REVIEWER OF JOURNAL OF INDONESIAN MATHEMATICAL SOCIETY
- REVIEWER OF JOURNAL OF MATHEMATICAL AND FUNDAMENTAL SCIENCES
- CHIEF EDITOR JURNAL MATEMATIKA DAN SAINS ITB

RESEARCH STUDENTS

AS CO-SUPERVISOR :

- DR. AMIR KAMAL AMIR PREPARED HIS DISSERTATION TITLED “STRUCTURE OF MINIMAL PRIME IDEALS AND FACTOR RINGS OF SKEW POLYNOMIAL RING OVER DEDEKIND DOMAIN” UNDER PUDJI ASTUTI’S AND MY SUPERVISION. HE DEFENDED HIS DISSERTATION OCTOBER 21, 2011. AT THE MOMENT HE IS WORKING AT THE HASANUDDIN UNIVERSITY, MAKASSAR.
- ERMA SUWASTIKA, FAISAL AND TITO WALUYO PURBOYO PREPARE THEIR DISSERTATIONS SINCE SEPTEMBER 2010.
- DARMAJID, I GEDE ADHITYA WISNU WARDHANA, KHAERUDIN SALEH PREPARE THEIR DISSERTATIONS SINCE SEPTEMBER 2012.

AS PRINCIPAL SUPERVISOR :

- ADITYA PURWA SANTIKA PREPARE HIS DISSERTATION SINCE SEPTEMBER 2010.
- IRWANSYAH AND NOPENDRI PREPARE THEIR DISSERTATIONS SINCE SEPTEMBER 2013.

MEMBER OF PHD THESIS EXAMINERS :

- DR DELLAVITHA NASUTION “DEGENERATIONS FOR DERIVED CATEGORIES” UNIVERSITE DE PICARDIE 2013
- DR NUR INAYAH “(A,D)-H-ANTIMAGIC LABELINGS ON SOME CLASSES OF GRAPHS” ITB 2013
- DR ADIWIJAYA “GRAPH CHARACTERIZATION BASED ON THEIR F-CHROMATIC INDEX” ITB 2012
- DR TITA KHALIS MARYATI “CHARACTERIZATION OF H-MAGIC GRAPHS AND H-SUPERMAGIC GRAPHS” ITB 2011
- DR I WAYAN SUDARSANA “RAMSEY NUMBERS FOR A UNION OF GRAPHS” ITB 2011
- DR HANNI GARMINIA “HEREDITARY AND COHEREDITARY STRUCTURES” ITB 2008

WORK EXPERIENCE

- FACULTY MEMBER, FACULTY OF MATHEMATICS AND NATURAL SCIENCES, INSTITUT TEKNOLOGI BANDUNG (ITB), 1998–PRESENT.

- RESEARCH ASSOCIATE (EPSRC RESEARCH FELLOWSHIP AND LEVERHULME TRUST VISITING FELLOWSHIP) AT UNIVERSITY OF LEICESTER, 2004-2005
- RESEARCH ASSOCIATE AT NTNU NORWAY 2005-2006
- RESEARCH ASSOCIATE AT TOKUSHIMA BUNRI UNIVERSITY JAPAN 2010
- JUNIOR ASSOCIATE ICTP 2010-2015

RESEARCH

- **RISET KK ITB 2014** : SKEW POLYNOMIAL RINGS IN CODING THEORY (PRINCIPAL INVESTIGATOR), NETWORK HARDENING MODEL AND SIMULATION (MEMBER)
- **RISET DESENTRALISASI DIKTI 2014** : ALMOST PRIME AND STRONGLY PRIME SUBMODULES OF A FINITELY GENERATED MODULE OVER A PRINCIPAL IDEAL DOMAIN (MEMBER), GEOSTATISTIC MODELLING (MEMBER)
- **STIC-ASIE 2013-2014 PROJECT** (SCIENCES ET TECHNOLOGIES DE L'INFORMATION ET DE LA COMMUNICATION), FINANCED BY THE FRENCH MINISTRY OF FOREIGN AFFAIRS AND LINKING THE LAMFA FOR FRANCE, ITB AND UGM FOR INDONESIA, BEIJING NORMAL UNIVERSITY AND EAST CHINA NORMAL UNIVERSITY FOR CHINA (INDONESIAN COORDINATOR)
- **RESEARCH ASAHI GLASS FOUNDATION: ACCELERATING PARALLELIZED POLLARD RHO TO IDENTIFY WEAK CLASS ELLIPTIC CURVES** (PRINCIPAL INVESTIGATOR, JUNE 2012- JUNE 2013)
- **RISET KK ITB 2013** : GENERALIZATION OF DEDEKIND PRIME RINGS AND HNP RINGS (PRINCIPAL INVESTIGATOR), NOISE-BASED STEGO-ECC (MEMBER), NORMAL BASIS IN CODES OVER FINITE RINGS (MEMBER), MULTIPLE ATTACK GRAPH BASED SECURITY METRICS FOR NETWORK SECURITY (MEMBER)
- **COMPETITIVE GRANT DGHE (HIBAH BERSAING DIKTI) 2011-2012** : ON BLOCKS WITH COMMUTATIVE DEFECT GROUP (PRINCIPAL INVESTIGATOR)
- **COMPETENCE GRANT DGHE (HIBAH KOMPETENSI DIKTI) 2010-2012**: EFFICIENT ALGORITHMS FOR ELLIPTIC CURVE CRYPTOGRAPHY BASED ON COMPOSITE FIELD (MEMBER)
- **OUTSTANDING DOCTORAL FELLOWSHIP IMHERE**: FINITE RINGS IN CRYPTOGRAPHY AND CODING THEORY, BATCH III 2011 (MEMBER), COMPLEX PROJECTIVE VARIETIES AND POLYDULE VARIETIES, BATCH II 2010 (PRINCIPAL INVESTIGATOR) AND INVARIANCE OF SUBALGEBRA OF CENTER OF GROUP ALGEBRAS, BATCH I 2010 (MEMBER)
- **RESEARCH AND INNOVATION PROGRAM ITB 2011**: NAKAYAMA ALGEBRAS WITH MUTATIONS (PRINCIPAL INVESTIGATOR)

OUTREACH

- MEMBER OF THE JURY "MATHEMATICS AND SCIENCES NATIONAL OLYMPIAD FOR UNIVERSITIES" (ONMIPA-PT) MATHEMATICS SECTION 2011-2013
- MEMBER OF THE SELECTION TEAM FOR INTERNATIONAL MATHEMATICS COMPETITION (IMC) 2011

- TRAINER ONMIPA PT AND IMC 2008-2013

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WORK EXPERIENCES

1. LECTURER IN ITB, JANUARI 1999 - NOW
2. *TEAM LEADER*, INDONESIAN TEAM FOR INTERNATIONAL MATHEMATICS COMPETITION FOR UNDERGRADUATE STUDENT DI BULGARIA, 2010 AND 2011.
3. TRAINER MATHEMATICS OLYMPIADE FOR UNDERGRADUATE STUDENTS 2006 – 2011.

RESEARCH EXPERIENCES

1. PRINCIPAL INVESTIGATOR, DEDEKIND MODULES AND VALUATION MODULES, RISET DESENTRALISASI DIKTI 2014
2. PRINCIPAL INVESTIGATOR, SPEKTRUM DARI HYPERMARIKS KETETANGGAAN DARI KELAS HYPERGRAPH GENERAL k -PARTITE, PROGRAM RISET DAN INOVASI, ITB, 2013
3. PRINCIPAL INVESTIGATOR, CHARACTERIZATION OF INTEGRAL SUNFLOWER HYPERGRAPH, PROGRAM RISET DAN INOVASI, ITB, 2012.
4. PRINCIPAL INVESTIGATOR, STRUCTURE OF DEDEKIND MODULES, OUTSTANDING DOCTORAL FELLOWSHIP, ITB, 2011.
5. PRINCIPAL INVESTIGATOR, KARAKTERISASI HYPERGRAPH INTEGRAL PADA KELAS HYPERGRAPH (N,R,D) -DESIGN, SUNFLOWER DAN HYPERCYCLE, PROGRAM RISET DAN INOVASI, ITB, 2011.
6. PRINCIPAL INVESTIGATOR, A NOTE ON DEDEKIND MODULES, FUNDED BY DIKTI, 2009.

PUBLICATIONS

1. M. A. MISRI, IRAWATI, H. GARMINIA Y (2013); GENERALIZATION OF B´EZOUT MODULES FAR EAST JOURNAL OF MATHEMATICAL SCIENCES VOL 72 No 1, 131-133.
2. S. SYLVIANI, H.GARMINIA, P.ASTUTI (2013), BEHAVIOR FOR TIME INVARIANT FINITE DIMENSIONAL DISCRETE LINEAR SYSTEMS, JOURNAL OF MATHEMATICAL AND FUNDAMENTAL SCIENCES VOL. 45 No. 1, 38-52.
3. M. A. MISRI, IRAWATI, H. GARMINIA Y (2012); [CYCLIC AND MULTIPLICATION P-BEZOUT MODULES](#) INTERNATIONAL JOURNAL OF ALGEBRA, VOL. 6, 2012, no. 21-24, 1117-1120.
4. M. ASTUTI, H. GARMINIA, A. N. M. SALMAN AND IRAWATI (2012) : INTEGRAL COMPLETE R -UNIFORM HYPERGRAPH AND SUNFLOWER HYPERGRAPH, FAR EAST JOURNAL OF MATHEMATICAL SCIENCES, VOLUME 65 ISSUE 1, PAGES 87 - 96
5. M. ASTUTI, IRAWATI, H. GARMINIA AND A.N.M. SALMAN, (2012) : THE PROPERTIES OF SOME COEFFICIENTS OF THE CHARACTERISTIC AND THE LAPLACIAN POLYNOMIAL OF A HYPERGRAPH, INTERNATIONAL JOURNAL OF CONTEMPORARY MATHEMATICAL SCIENCES. VOL. 7, 2012, no. 21-24, 1029-1035.
6. H. GARMINIA, G.RAHMAPUTRI, P. ASTUTI (2012), ON CLOSED SUBMODULES OF A FINITE RANK FREE MODULE OVER A COMPLETE DVR, JP JOURNAL OF ALGEBRA NUMBER THEORY AND APPLICATIONS VOL 27 No. 2, 169-179.
7. GARMINIA, H., ASTUTI, P., AND IRAWATI (2011) : A NOTE ON DEDEKIND MODULE, INTERNATIONAL JOURNAL OF ALGEBRA 5, No. 10, 491-498
8. GARMINIA, H., HAFIYUSHALEH M., AND ASTUTI, P (2010) : PENGARUH GANGGUAN PADA PERUBAHAN PRIORITAS DAN INDEKS KONSISTENSI MATRIKS PERBANDINGAN BERPASANGAN DALAM *ANALYTICAL HIERARCHY PROCESS*, JURNAL MATEMATIKA DAN SAINS ITB, 15(3),143-147.

9. MUCHTADI-ALAMSYAH,I., GARMINIA,H., ASTUTI,P. (2010): *QUIVERS OF BOUND PATH ALGEBRAS AND BOUND PATH COALGEBRAS*, ITB J. SCI. 42(2), 153-162
10. GARMINIA, H., ASTUTI, P., AND IRAWATI (2008): STRUKTUR MODUL HASIL BAGI DARI MODUL DEDEKIND, JURNAL MATEMATIKA DAN SAINS ITB, 13(4),114-117.
11. GARMINIA, H., ASTUTI, P., AND IRAWATI (2008) : AN INTERTWINNING OF A HEREDITARY ALGEBRA AND A COHEREDITARY COALGEBRA, JOURNAL OF FUNDAMENTAL SCIENCE, 4(1), 261-267 .
12. GARMINIA, H., ASTUTI, P., AND IRAWATI (2007) : PROPERTIES OF COHEREDITARY COMODULE, JURNAL MATEMATIKA DAN SAINS ITB, 12(2),79-83.
13. GARMINIA, H. DAN ASTUTI, P. (2006) : KARAKTERISASI MODUL $\Sigma[M]$ -KOHEREDITER, MAJALAH ILMIAH HIMPUNAN MATEMATIKA INDONESIA, 12(2), 225-231.

PUBLICATIONS IN PROCEEDINGS

1. E. KUSNIYANTI, H. GARMINIA, P. ASTUTI, SUATU SIFAT DARI GELANGGANG PRIMA DEDEKIND, PROSIDING KONFERENSI NASIONAL MATEMATIKA 2012.
2. S.E. IRWAN, H.GARMINIA, P. ASTUTI, SEKITAR SUBMODUL PRIMA DAN SUBMODUL MAKSIMAL ATAS GELANGGANG KOMUTATIF, PROSIDING SEMINAR NASIONAL MATEMATIKA UNS 2012.
3. M. ASTUTI, IRAWATI, H. GARMINIA, A.N.M. SALMAN (2010) : A NEW CLASS OF INTEGRAL HYPERGRAPHS, CONFERENCE ON INDUSTRIAL AND APPLIED MATHEMATICS, ITB, BANDUNG
4. M. ASTUTI, IRAWATI, H. GARMINIA, A.N.M. SALMAN (2010) : $(N; R ; \Delta)$ -DESIGN HYPERGRAPHS ARE INTEGRAL, INTERNATIONAL CONFERENCE ON ALGEBRA, UGM, JOGYAKARTA.
5. M. ASTUTI, IRAWATI, H. GARMINIA, A.N.M. SALMAN (2010) : STUDY ON EIGENVALUES OF SUNFLOWER HYPERGRAPHS THE THIRD INTERNATIONAL CONFERENCE ON MATHEMATICS AND NATURAL SCIENCES, ITB.

6. F. UTHIASARI, H. GARMINIA, AND P. ASTUTI (2010), JARAK ANTARA DUA SUBRUANG, SEMINAR NASIONAL ALJABAR, UIN SYARIF HIDAYATULLAH, JAKARTA.
7. M. ASTUTI, IRAWATI, H. GARMINIA, A.N.M. SALMAN, (2010) : SOME COEFFICIENTS OF THE CHARACTERISTIC POLYNOMIAL AND THE LAPLACIAN POLYNOMIAL OF A HYPERGRAPH $H(V, E)$. SEMINAR NASIONAL ALJABAR, UIN SYARIF HIDAYATULLAH, JAKARTA, INDONESIA.
8. I. MUCHTADI-ALAMSYAH, H. GARMINIA (2009): *QUIVERS OF PATH ALGEBRAS AND PATH COALGEBRAS*, PROCEEDING INDOMS INTERNATIONAL CONFERENCE ON MATHEMATICS AND ITS APPLICATIONS, JOGJAKARTA.
9. M. HAFIYUSHOLEH, H. GARMINIA, P. ASTUTI (2009)., PENGARUH GANGGUAN PADA MATRIKS PAIRWISE COMPARISON TERHADAP INDEKS KONSISTENSI DALAM AHP, SEMINAR NASIONAL MATEMATIKA DAN PENDIDIKAN MATEMATIKA, UNESA, SURABAYA.
10. H. GARMINIA, P. ASTUTI (2008) : *ORDER AND DEDEKIND MODULES*, SEMINAR KEBANGSAAN PENGOPTIMUMAN BERANGKA DAN PENYELIDIKAN OPERASI KE-2, UTM, TRENGGANU, MALAYSIA.
11. H. GARMINIA, P. ASTUTI, AND IRAWATI (2006) : ON THE COHEREDITARY COMODULES, 2ND IMT-GT REGIONAL CONFERENCE ON MATHEMATICS, STATISTICS AND APPLICATIONS, USM, PENANG, MALAYSIA.
12. H. GARMINIA, P. ASTUTI, P., AND IRAWATI (2006) : KOALJABAR SEBAGAI DUALISASI DARI ALJABAR ATAS GELANGGANG KOMUTATIF SEMINAR NASIONAL MATEMATIKA, STATISTIKA DAN PENDIDIKAN MATEMATIKA, UNPAD, BANDUNG.
13. H. GARMINIA, P. ASTUTI, AND IRAWATI (2006) : GRUP $\mathbf{Z}_3 \otimes (\mathbf{Z}_6)^2$ SEBAGAI KOMODUL- $(\mathbf{Z}_6)^2$, SEMINAR NASIONAL MAHASISWA S3 MATEMATIKA SE-INDONESIA, UPI, BANDUNG.
14. D. NASUTION, H. GARMINIA, AND P. ASTUTI (2005) : SUBMODUL STACKED DARI MODUL YANG DIBANGUN SECARA HINGGA ATAS DAERAH IDEAL UTAMA, SEMINAR NASIONAL ALJABAR, ITB, BANDUNG

15. H. GARMINIA, AND E.T. BASKORO (2000) : ALMOST MOORE DIGRAPHS OF DEGREE 4 AND DIAMETER K, PROSIDING ITB