강원경기수학회 2012년도
학술발표회 및 정기총회

일시 : 2012. 6. 8(금) 13:30 - 21:00
장소 : 경기대학교 수원캠퍼스 종합강의동

* 주최 : 강원경기수학회
* 주관 : 경기대학교 수학과
* 후원 : 대한수학회

강원경기수학회 2012년도 학술발표회 및 정기총회 프로그램

학술발표회 및 정기총회

1. 일　　시 : 2012년 6월 8일 (금) 13 : 30 ~ 21 : 00

2. 장　　소 : 경기대학교 수원캠퍼스 종합강의동

3. 세부일정

♣ 6월 8일 (금요일)

○ 등　　록 ·····	13 : 30 ~ 14 : 00
○ 개 회 식 ·····	14 : 00 ~ 14 : 10
○ 대한수학회장 격려사 ·····	14 : 10 ~ 14 : 20
○ 초청강연 ·····	14 : 20 ~ 15 : 00
○ 휴　　식 ·····	15 : 00 ~ 15 : 10
○ 논문발표 (1부) ·····	15 : 10 ~ 16 : 10
○ 휴　　식 ·····	16 : 10 ~ 16 : 20
○ 논문발표 (2부) ·····	16 : 20 ~ 17 : 20
○ 휴　　식 ·····	17 : 20 ~ 17 : 40
○ 정기총회 ·····	17 : 40 ~ 18 : 30
○ 만　　찬 ·····	18 : 30 ~ 21 : 00

4. 기타 사항

° 만찬장 : 옛골토성(광교산점)(031-245-3400)
° 숙박을 하실 분들은 등록 시에 비치된 방명록에 체크해 주시기 바랍니다.
° 연락처: 김동석교수(010-2811-6678), 또는 김병문교수(010-6377-6540)

학술발표회 일정

구분	시간	6월 8일(금요일)					
		발표자	논문제목	발표자	논문제목	발표자	논문제목
등록	13:30-14:00	참가자 등록					
개회	14:00-14:10	개회식(강원경기수학회장 인사말)					
	14:10-14:20	대한수학회장 격려사					
초청강연	14:20-15:00	초청강연회 (209호 세미나실, 좌장: 김명재(경기대)) 연사: 박종일(서울대) 제목: Smooth 4-manifolds and gauge theory					
휴식	15:00-15:10	다과 및 환담(휴게실:409호)					
논문발표	15:10-17:20	Session I (대수학 및 응용수학: 411호)		Session II (해석학: 412호)		Session III (이산수학: 408호)	
논문발표 1부	15:10-16:10	좌장	김병학(경희대)	좌장	최규흥(인하대)	좌장	박영호(강원대)
	15:10-15:30	**김동석** (경기대)	Representation theory of quantum Lie algebras and Lie super algebras	**김광휘** (강남대)	Superstability of an generalized Pexider type exponential functional equation	**방세정*** (영남대) **Jack Koolen** (POSTECH)	Nonexistence of distance-regular graphs with intersection array $\left\{\begin{matrix}3\alpha+3, 2\alpha+2, \alpha+2-\beta: \\ 1, 2, 3\beta\end{matrix}\right\}$ $(\alpha \geq \beta > 1)$
	15:30-15:50	**오주목** (강릉원주대)	Counting chains of subgroups in the lattice of subgroups of a cyclic group	**박춘길***(한양대) **Lexin Li** (Shenyang Ligong University) **Gang Lu** (ShenYang Univ. of Technology)	Functional inequalities in generalized quasi-Banach spaces	**천기상** (성균관대)	The Bessel numbers and set partitions with restrictions on blocks
	15:50-16:10	**김경원*** (성균관대) **이상구** (성균관대)	Sage-Math Tools and Contents for Linear Algebra	**최종근*** (연세대) **김세익** (연세대)	Neumann functions for second order elliptic systems with measurable coefficients	**손무영** (창원대)	Some results on locating-total domination number
휴식	16:10-16:20	다과 및 환담(휴게실: 409호)					
논문발표 2부	16:20-17:20	좌장	함윤미(경기대)	좌장	이정례(대진대)	좌장	김병문(강릉원주대)
	16:20-16:40	**표재홍** (강원대)	Error Estimates for The Second Order Semi-Discrete Stabilized Gauge-Uzawa Method	**Manfeng Hu*** (Jiangnan University) **Yinghua Jin** (Jiangnan University)	Stability of genetic networks with hybrid regulatory mechanism	**권영수** (영남대)	Classification of regular embeddings of $n-$cubes and folded $n-$cubes
	16:40-17:00	**김신욱** (강남대)	Integrative computational methods to predict miRNA/mRNA relations using cancer data sets	**조동현** (경기대)	An integral transform similar to Fourier transform on a Banach space	**김혜경** (대구카톨릭대)	Signed 2-independence of Cartesian product of directed paths
	17:00-17:20	**이정엽** (관동대)	Aperiodic mono-tile tiling	**최규흥***(인하대) **정택선**(군산대)	Applications of Critical Point Theorems to Nonlinear Beam Problems	**이재운** (영남대)	Enumerating finite topologies associated with a finite graph
휴식	17:20-17:40	다과 및 환담(휴게실: 409호)					
총회	17:40-18:30	정기총회 (405호)					
석식	18:30-20:30	만찬: 옛골토성(광교산점)(031-245-3400)					

* 참조사항 - 사정에 따라 프로그램의 일부 조정이 있을 수도 있습니다.

발표논문 초록

Invited Lecture
(초청 강연)

발표자 : 박종일(서울대학교), jipark@snu.ac.kr

제 목 : Smooth 4-manifolds and gauge theory

내 용 :

In this talk I'd like to explain why gauge theory - Donaldson theory and Seiberg-Witten theory - is so powerful in study of smooth 4-manifolds. Furthermore, I'd like to review briefly what we can do and what we cannot do in study of smooth 4-manifolds using gauge theory.

Session I
(Algebra and Applied mathematics)

1. **발표자 : 김동석(경기대학교), dongseok@kgu.ac.kr**

제 목 : Representation theory of quantum Lie algebras and Lie supre algebras

내 용 :

Temperley-Lieb algebras have been generalized to web spaces for rank2 simple Lie algebras which produces generalization of Jones polynomials.

In this talk, I will explain representation category of Lie algebras and Lie super algebras and Lie super algebras including sl(3) sl(4), sl(n), so(5), so(7), so(8) and sl(1|1).

2. 발표자 : 오주목(강릉원주대학교), jumokoh@gwnu.ac.kr

제 목 : **Counting chains of subgroups in the lattice of subgroups of a cyclic group**

내 용 :

In this talk I give an explicit formula for the number of chains of subgroups in the lattice of subgroups of a cyclic group.

3. 발표자 : 김경원(성균관대학교)*, kwkim@skku.edu

이상구(성균관대학교)

제 목 : **Sage-Math Tools and Contents for Linear Algebra**

내 용 :

Linear Algebra is the first abstract mathematics subject for most of new college students. Hence, most of students face some difficulties to deal with various novel mathematical concepts. In this paper, we introduce the visualization of linear algebra concepts which are developed with Sage(a free web site to do mathematical computations). Sage-Math has been developed at the University of Washington in 2005. Sage includes many features and functions are Web-Mathematica enough to surpass. Students don't need any program installed on their computer, since they can access any avaliable Sage server in the world from anywhere at anytime to perform their mathematical computations and simulations. These can be used for students' better understanding in college mathematics education as well as a secondary school mathematics education.

You can find these contents for your test or teaching at the following web site : http://matrix.skku.ac.kr/2012-sage/sage-la.

4. 발표자 : 표재홍(강원대학교), jhpyo@kangwon.ac.kr

제 목 : **Error Estimates for The Second Order Semi-Discrete Stabilized Gauge-Uzawa Method**

내 용 :

The Gauge-Uzawa method [GUM], which is a projection type algorithm to solve the time depend Navier-Stokes equations, has been constructed and enhanced to apply to more complicated problems. Even though GUM possesses many advantages theoretically and numerically, the studies on GUM have been limited on the first order backward Euler scheme except normal mode error estimate. The goal of this paper is to research the 2nd order GUM. Because the classical 2nd order GUM needs rather strong stability condition, we modify GUM to be unconditionally stable method using BDF2 time marching. The stabilized GUM is equivalent to the rotational form of pressure correction method and the errors are already estimated for the Stokes equations. In this paper, we will evaluate errors of the stabilized GUM for the Navier-Stokes equations. We also prove that the stabilized GUM is an unconditionally stable method for the Naiver-Stokes equations. So we conclude that the rotational form of pressure correction method is also unconditionally stable scheme and that the accuracy results are valid for the Navier-Stokes equations.

5. 발표자 : 김신욱(강남대학교), kshinuk@bu.edu

제 목 : **Integrative computational methods to predict miRNA/mRNA relations using cancer data sets**

내 용 :

In this study we introduce a computational method to predict miRNA/mRNA relations by using both gene expression profiles and DNA-based putative target genes of microRNA provided from web site such as miRanda and Pictar.

6. 발표자 : 이정엽(관동대학교), jylee@kwandong.ac.kr

Robert V. Moody, (University of Victoria)

제 목 : **Aperiodic mono-tile tiling**

내 용 :

In the study of aperiodic tilings, it has long been an open question whether there exists a tiling made by single prototile with matching rules whose translations, rotations, and reflections tile a plane only in aperiodic way. Taylor and Socolar have found such an example (T-S tiling). Recently there have been studies on this tiling from various aspects. In this talk we introduce this aperiodic mono-tile tiling and discuss properties of this tiling from the point of view of mathematical quasicrystals. We consider a parity tiling removing all the coloured information of T-S tiling. It turns out that T-S tiling is mutually locally derivable from the parity tiling.

Session II
(Analysis)

1. 발표자 : 김광휘(강남대학교), ghkim@kangnam.ac.kr

제 목 : **Superstability of an generalized Pexider type exponential functional equation**

내 용 :

The paper aims to prove the superstability of the generalized Pexider type exponential functional equation

$$f(x+y)^m = g(x)h(y),$$

where $f,g,h : G \to \mathbb{R}$ are unknown mappings and m is a fixed positive integer. Here G is an Abelian group and $\mathbb{R}$ is the field of real numbers.

2. 발표자 : 박춘길(한양대학교), baak@hanyang.ac.kr

Lexin Li(Shenyang Ligong University)

Gang Lu(ShenYang University of Technology)

제 목 : **Functional inequalities in generalized quasi-Banach spaces**

내 용 :

We investigate the Hyers-Ulam stability of the following function inequalities

$$\|af(x)+bf(y)+cf(z)\| \leqq \|Kf(\frac{ax+by+cz}{K})\| \ (0<|K|<|a+b+c|),$$

$$\|af(x)+bf(y)+Kf(z)\| \leqq \|Kf(\frac{ax+by}{K}+z)\| \ (0<|K|<|a+b+K|),$$

in generalized quasi-Banach spaces.

3. 발표자 : 최종근*(연세대학교), jkchoi2749@gmail.com

김세익(연세대학교)

제 목 : **Neumann functions for second order elliptic systems with measurable coefficients**

내 용 :

We study Neumann functions for divergence form, second order elliptic systems with bounded measurable coefficients in a bounded Lipschitz domain or a Lipschitz graph domain. We establish existence, uniqueness, and various estimates for the Neumann functions under the assumption that weak solutions of the system enjoy interior Hölder continuity. Also, we establish global pointwise bounds for the Neumann functions under the assumption that weak solutions of the system satisfy a certain natural local boundedness estimate. Moreover, we prove that such a local boundedness estimate for weak solutions of the system is in fact equivalent to the global pointwise bound for the Neumann function.

4. 발표자 : **Manfeng Hu*(Jiangnan University), humanfeng@jiangnan.edu.cn**
Yinghua Jin(Jiangnan University)

제 목 : **Stability of genetic networks with hybrid regulatory mechanism**

내 용 :

A dynamical system model is presented in this paper for genetic regulatory networks with hybrid regulatory mechanism. The sufficient conditions for the stability of proposed model are established based on Lyapunov functional method and linear matrix inequality techniques. To test the effectiveness and correctness of our theoretical results, illustrative examples regarding modified repressilator and a modified five-node genetic networks model are also presented.

5. 발표자 : 조동현(경기대학교), j94385@kyonggi.ac.kr

제 목 : **An integral transform similar to Fourier transform on a Banach space**

내 용 :

In this talk, we develop a generalized conditional Fourier transform and convolution on a function space. In fact, we introduce an analogue Wiener space and then evaluate conditional expectation on the space using a simple formula which calculates the conditional expectation directly in terms of the ordinary expectations. Using the evaluation formulas, we calculate the analytic conditional Fourier-Feynman transform of the conditional convolution product for some functions. We will finally prove that the conditional integral transform of the convolution of the functions can be interpreted as the product of the analytic conditional Fourier-Feynman transform of each function.

6. 발표자 : 최규흥*(인하대학교), qheung@inha.ac.kr
정택선(군산대학교)

제 목 : **Applications of Critical Point Theorems to Nonlinear Beam Problems**

내 용 :

Let L be the differential operator, $Lu = u_{tt} + u_{xxxx}$. We consider nonlinear beam equations, $Lu + bu^{+} = f$, in H, where H is the Hilbert space spanned by eigenfunctions of L. We reveal the existence of multiple solutions of the nonlinear beam problems by critical point theorems.

Session III
(Discrete Mathematics)

1. 발표자 : 방세정*(영남대학교),sjbang@ynu.ac.kr
Jack Koolen(POSTECH)

제 목 : **Nonexistence of distance-regular graphs with intersection array** $\{3\alpha+3, 2\alpha+2, \alpha+2-\beta : 1, 2, 3\beta\}(\alpha \geqq \beta > 1)$

내 용 :

A noncomplete distance-regular graph Γ is called geometric if there exists a set C of Delsarte cliques such that each edge of Γ lies in a unique clique in C. In [1] we characterized the geometric distance-regular graphs with smallest eigenvalue -3. Let Γ be a distance-regular graph with intersection array $\{3\alpha+3, 2\alpha+2, \alpha+2-\beta : 1, 2, 3\beta\}(\alpha \geqq \beta > 1)$ Then Γ is a geometric distance-regular graph with smallest eigenvalue -3. In the list of [2, Chapter 14], only the Hamming graph $H(3, q+2)$), the Doob graph of diameter 3 and the intersection array $\{45, 30, 7 : 1, 2, 27\}$satisfy this intersection array. Gavrilyuk and Makhnev [3] proved that there are no distance-regular graphs with intersection array $\{45, 30, 7 : 1, 2, 27\}$. In this talk, we will show that there are no distance-regular graphs with intersection array $\{3\alpha+3, 2\alpha+2, \alpha+2-\beta : 1, 2, 3\beta\}(\alpha \geqq \beta > 1)$.

References [1] S. Bang, Geometric distance-regular graphs without 4-claws, submitted for publication. [2] A. E. Brouwer, A. M. Cohen and A. Neumaier, Distance-regular graphs, Springer-Verlag, Berlin, 1989. [3] A. L. Gavrilyuk and A. A. Makhnev, On a class of geometric distance-regular graphs without 4-claws, accepted for publication.

2. 발표자 : 천기상(성균관대학교), gscheon@skku.edu

제 목 : **The Bessel numbers and set partitions with restrictions on blocks**

내 용 :

The Stirling numbers and the Bessel numbers have a long history and both have been generalized in a variety of directions. Here we present a second level generalization that has both as special cases. This generalization preserves the inverse relation between the first and second kind and has simple combinatorial interpretations. We also frame the discussion in terms of the exponential Riordan group. Then the inverse relations are just the group inverse and factoring inside the group leads to many results connecting the various Stirling and Bessel numbers.

3. 발표자 : 손무영(창원대학교), mysohn@changwon.ac.kr

제 목 : **Some results on locating-total domination number**

내 용 :

In this talk, we discuss the definitions and the known results of locating-total domination number of a graph. We will study new bounds on locating-total domination number of a tree. Moreover we will tell characterization of the extremal trees satisfying some bounds.

4. 발표자 : 권영수(영남대학교), ysookwon@ynu.ac.kr

제 목 : **Classification of regular embeddings of $n-$cubes and folded $n-$cubes**

내 용 :

In this talk, we will introduce a regular embedding which is highly symmetric graph embedding like five Platonic solids and consider some method to classify regular embeddings of given graphs. Classifications of regular embeddings of $n-$cubes and folded $n-$cubes obtained by the above introduced method will be given.

5. 발표자 : 김혜경(대구카톨릭대학교), hkkim@cu.ac.kr

제 목 : **Signed 2-independence of Cartesian product of directed paths**

내 용 :

A two-valued function $f: V(D) \to \{-1,1\}$ defined on the vertices of a digraph $D=(V(D),A(D))$ is called a signed 2-independence function if $f(N^-[v]) \leqq 1$ for every v in D. The weight of a signed 2-dependence function is $F(V(D)) = \sum_{v \in V(D)} f(v)$. The maximum weight of a signed 2-independence function of D is the signed 2-independence number $\alpha_s^2(D)$ of D. Let $P_m \times P_n$ be the Cartesian product of directed paths P_m and P_n. In this paper, we determine the exact value of $\alpha_s^2(P_m \times P_n)$ when $m \leqq 5$.

6. 발표자 : 이재운(영남대학교), julee@ynu.ac.kr

제 목 : **Enumerating finite topologies associated with a finite graph**

내 용 :

In this talk, we will discuss an enumeration method for finite topological spaces and find the numbers for some classes of graphs.

M/E/M/O

M/E/M/O

M/E/M/O

M/E/M/O