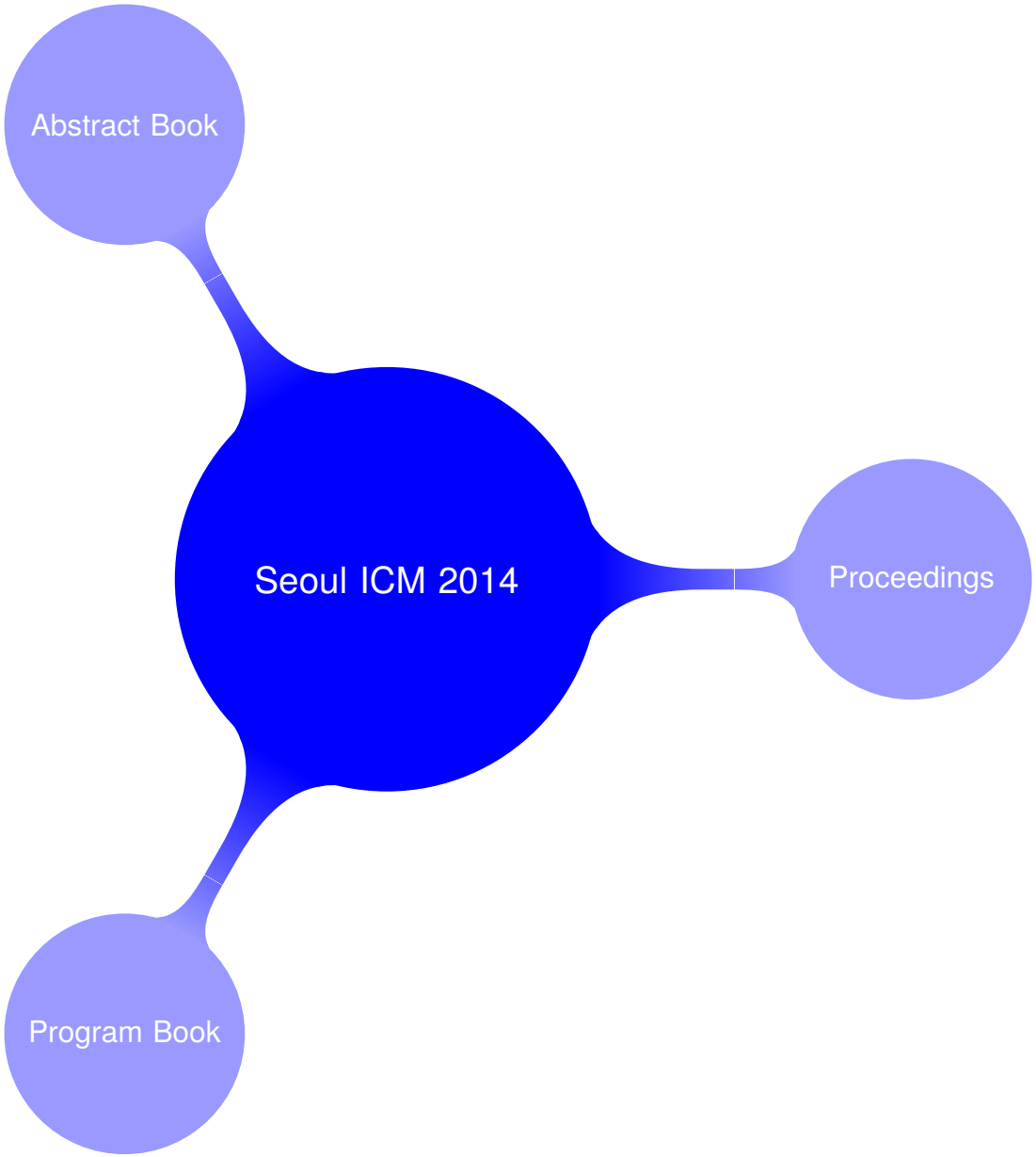
TEX으로 초록집과 프로그램북 만들기

서강대학교 수학과
권현우

2015 한국텍학회 정기총회 및 **KTUG** 컨퍼런스

Contents



Seoul ICM 2014

- 최근 4년간 일어났던 중요한 수학적 업적들을 평가 및 시상하며, 다양한 수학분야에 관한 토론 및 강연들이 열리는 전 세계 수학자들의 축제
- 약 5000명의 수학자가 참석한 학회.
- 2014년 8월 13일부터 21일까지 서울 COEX에서 개최되었다.

Why TEX?

- ICM 기조연설자, 초청강연자, Short Communication, Poster Session까지 총 1376개 초록과 약 179개의 논문.

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- 작업을 해야 하는 총 페이지수가 약 6000페이지

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- 작업을 해야 하는 총 페이지수가 약 6000페이지
- 6000페이지를 5개월간 오류를 최소화할 수 있는 출판을 해야 하는 상황 (개최는 8월인데, 연락이 온게 3월 24일쯤)

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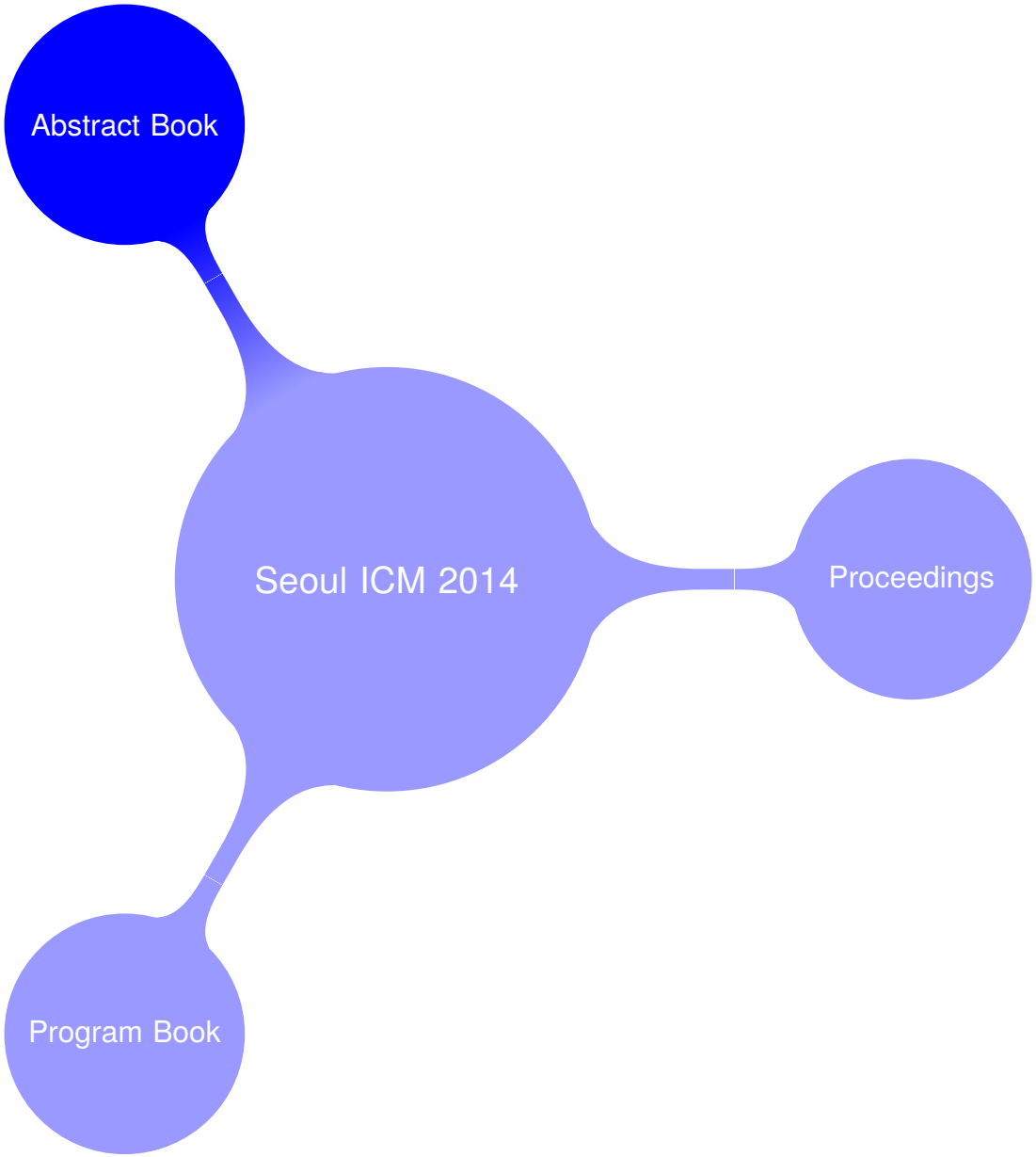
이 모든 상황을 비교적 원만하게 해결할 수 있는 조판시스템은 TEX뿐이다.

Contents



Abstract Book

ICM Seoul 2014 Abstract Book (작업기간 : 5월 29일 – 8월 11일)

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- 이름, 소속, 메일주소
- 발표분야 MSC, 키워드, 발표의 초록
- 누가 발표자인가? 누가 교신저자인가?

Abstract Book - 자료의 문제점

1. 당시에 초록 입력시스템이 만들어진 때에 KTUG 관련자가 없던 상태. MathJaX로 충분하다고 생각했기 때문에 TEX파일 제출보다 온라인상에서 입력을 하도록 했다 함.

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2. 많은 사람들이 예상하던대로 TEX코드를 입력하기보다 PDF로 드래그해서 입력하는 사태가 벌어짐.

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- 후에 rocky777님이 수식에러를 모두 수작업으로 잡아냄.

Abstract Book - 초창기 자료

Oral ONLY

OO-02-0786

Dr. Behrooz Khosravi
Mathematics, Amirkabir University of Technology, **Iran**

Recognition of some finite groups by order and some information on their character degrees

[1]Behrooz Khosravi (Amirkabir University of Technology, Iran)
[2]Behnam Khosravi (Institute for Advanced Studies in Basic Sciences, Zanjan, Iran)
[3]Bahman Khosravi (Qom University of Technology, Iran)
[4]Zahra Momen (Amirkabir University of Technology, Iran)

Speaker: Behrooz Khosravi (khosravibbb@yahoo.com)
Ph.D/Dr from Amirkabir University of Technology, **Iran** in 2002 (Advisor: Ali Iranmanesh)

Corresponding: Behrooz Khosravi (khosravibbb@yahoo.com)

Keywords: Recognition, character degree, character degree graph, order, simple group

2010 Mathematics Subject Classification. 20C15, 20D05, 20D60

There are several graphs attached to the set of character degrees of a finite group that have been studied. Results on these graphs are often useful to prove results that provide structural information of the group from some property of the set of character degrees. The graph that has been most commonly studied is the character degree graph of G. The character degree graph is the graph whose vertices are the prime divisors of the character degrees of the group G and two vertices p and p' are joined by an edge if pp' divides some character degree of G. In this talk we show that if p is a prime number, then the simple group $PSL(2, p)$ is uniquely determined by its order and its character degree graph. Also we show that if G is a simple group of order less than 6000, then G is uniquely determined by its character degree graph and its order. Also by an example we show that this result is not true for all simple groups.

Abstract Book - 원리엿보기

```
\SetValue{p fName}{Tom}
\SetValue{p lName}{Sanders}
\SetValue{p organization}{University of Oxford}
\SetValue{p country}{United Kingdom}
\SetValue{p eEmail}{tom.sanders@maths.ox.ac.uk}
\SetValue{c fName}{Tom}
\SetValue{c lName}{Sanders}
\SetValue{c organization}{University of Oxford}
\SetValue{c country}{United Kingdom}
\SetValue{c eEmail}{tom.sanders@maths.ox.ac.uk}
\SetValue{registration}{1530}
\SetValue{payment}{Y}
\SetValue{Author fName 1}{Tom}
\SetValue{Author lName 1}{Sanders}
\SetValue{Author eEmail 1}{tom.sanders@maths.ox.ac.uk}
\SetValue{Author organization 1}{University of Oxford, United Kingdom}
\SetValue{Author fName 2}{}
\SetValue{Author lName 2}{}
\SetValue{Author eEmail 2}{}
\SetValue{Author organization 2}{}
\SetValue{Author fName 3}{}
\SetValue{Author lName 3}{}
\SetValue{Author eEmail 3}{}
\SetValue{Author organization 3}{}
\SetValue{Author fName 4}{}
\SetValue{Author lName 4}{}
\SetValue{Author eEmail 4}{}
```

1. 일정한 양식에 맞게 데이터가 입력된 TEX파일을 불러들인다.

```
\SetValue{summary}{%
We discuss Roth's theorem on arithmetic progressions through the lens of approximate
groups.
}
\ProcessData
```

2. 일시적으로 저장된 정보를 처리하는 명령어 \ProcessData라 정의하자. \ProcessData는 받아들인 정보를 가공해서 일정한 형태로 만들게 해주는 명령어로 만든다.

Abstract Book - 원리엿보기

```
\IfEmpty{Author lName 1}\else%
   \pgfkeysgetvalue{Author lName 2}{\temp}\ifx\temp\empty%
    \noindent{\fontsize{11pt}{13pt}\selectfont\pgfkeysvalueof{Author fName 1}
\pgfkeysvalueof{Author lName 1}}\stepcounter{authornumber}%
    \else%
    \noindent{\fontsize{11pt}{13pt}\selectfont\pgfkeysvalueof{Author fName 1}
\pgfkeysvalueof{Author lName
1}}\processauthor\processemailauthor\speakerprocess\corresprocess%
    \fi%
    \pgfkeysgetvalue{Author lName 2}{\temp}\ifx\temp\empty% 2번째 사람 시작
    \else%
    \pgfkeysgetvalue{Author lName 3}{\temp}\ifx\temp\empty%
        {\fontsize{11pt}{13pt}\selectfont and \pgfkeysvalueof{Author fName 2}
\pgfkeysvalueof{Author lName
2}}\processauthor\processemailauthor\speakerprocess\corresprocess%
        \else%
        {\fontsize{11pt}{13pt}\selectfont, \pgfkeysvalueof{Author fName 2}
\pgfkeysvalueof{Author lName
2}}\processauthor\processemailauthor\speakerprocess\corresprocess%
        \fi%
```

3. 중복된 정보를 최소화한다. 주소중복을 막는 알고리즘을 만든다. 발표자는 $*$, 교신저자는 †로 표시하도록 한다. 이는 `ifthen`을 이용해서 쉽게 할 수 있다.

Abstract Book - 원리엿보기

```
\newcounter{ourindex}%
\setcounter{ourindex}{1}
\setcounter{addressnumber}{1}%
\newcommand{\processaddress}{%
\SetValue{flag}{0}%
\setcounter{count}{1}%
%\setcounter{countt}{1}
\forloop{settingnumberr}{0}{\value{settingnumberr}<\theaddressnumber}%
{%
    \ifthenelse{\equal{\pgfkeysvalueof{Author organization \thecount}}{\pgfkeysvalueof{Author organization \theaddressnumber}}}%
    {%
        \ifthenelse{\thecount<\theaddressnumber}%
        {%
        }%
        {%
            \ifthenelse{\equal{\pgfkeysvalueof{flag}}{0}}%
            {%
                \noindent$^{\theourindex}$\pgfkeysvalueof{Author organization \theaddressnumber}\par
                \stepcounter{ourindex}%
                \SetValue{flag}{1}%
            }%
            {%
            }%
        }%
    }%
    {%
        \stepcounter{count}%
    }%
}
{%
}%
    \stepcounter{addressnumber}%
}
```

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Abstract Book - 원리엿보기

```
\newcommand{\speakerprocess}{%
%%%% index part%%%%%%%%%%%%%
\index{\pgfkeysvalueof{Author lName \theauthornumber}, \pgfkeysvalueof{Author fName \theauthornumber}}%
%%%%%
\ifthenelse{\equal{\pgfkeysvalueof{Author fName \theauthornumber} \pgfkeysvalueof{Author lName \theauthornumber}}
{\pgfkeysvalueof{p fName} \pgfkeysvalueof{p lName}}}{%true
$^{*}$%
}%
{%false
%
}%
%
}
```

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SC02-12-03

Recognition of some finite groups by order and some information on their character degrees

Behrooz Khosravi[1,a*], Behnam Khosravi[2], Bahman Khosravi[3], and Zahra Momen[1]
[1]Amirkabir University of Technology, Iran
[2]Institute for Advanced Studies in Basic Sciences, Zanjan, Iran
[3]Qom University of Technology, Iran
[a]khosravibbb@yahoo.com

2010 *Mathematics Subject Classification.* 20C15, 20D05, 20D60
Keywords. Recognition, character degree, character degree graph, order, simple group

P18-02

South Texas models for course redesign in mathematics

Taeil Yi[1,a†] and Jerzy Mogilski[1,b*]
[1]University of Texas at Brownsville, United States of America
[a]taeil.yi@utb.edu
[b]jerzy.mogilski@utb.edu

2010 *Mathematics Subject Classification.* 97B40, 97D40, 97U50, 97U70, 97B50
Keywords. Course redesign, online/hybrid course, scheduled flipped classroom, open tutoring session, online office hour

4. Algebraic and Complex Geometry

SC04-09-03

An elementary proof of the Ohsawa-Takegoshi extension theorem

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Nagasaki university, Japan
k-adachi@nagasaki-u.ac.jp

2010 *Mathematics Subject Classification.* 32A26
Keywords. L^2 extension of holomorphic functions, pseudoconvex domains

In this talk I give an alternative proof of the Ohsawa-Takegoshi extension theorem. In order to prove the Ohsawa-Takegoshi extension theorem, Jarnicki-Pflug, whose proof is based on Siu's idea, used the result due to Hormander in 1965, which means that $C^2(\Omega) \cap D_{T^*}$ is dense in $D_{T^*} \cap D_S$ for the graph norm. But its proof is very difficult. Instead of using this theorem, we consider three Hilbert spaces with three different weight functions which Hormander used in his famous book in order to prove L^2 estimate for solutions of the $\bar{\partial}$-problem in pseudoconvex domains. I prove the Ohsawa-Takegoshi extension theorem only using the elementary Hilbert space theory technique. Therefore, my proof is accessible for beginners.

SC04-10-02

The weight filtration on the logarithmic de Rham complex

Alexander Aleksandrov
Institute of Control Sciences RAS, Russian Federation
ag_aleksandrov@mail.ru

2010 *Mathematics Subject Classification.* 32S65, 14B05, 14F10, 58K45
Keywords. Multiple residue, weight filtration, logarithmic de Rham complex, logarithmic differential forms, regular meromorphic forms

The concept of the weight filtration on the logarithmic de Rham complex for divisors with normal crossings on a complex manifold was introduced by P. Deligne (1971) in describing the mixed Hodge structure on the cohomology of the complement of a divisor. Since then, this theory has been extensively developed in many directions for various types of varieties and cohomology theories. However, almost all known generalizations are based on the reduction of the situation under consideration to the case of a divisor with normal crossings, on general theorems on resolution of singularities, and on the functoriality of the notion of the mixed Hodge structure and related constructions.

The purpose of the talk is to give a natural construction of the weight filtration on the logarithmic de Rham complex for divisors whose irreducible components are given locally by a regular sequence of holomorphic functions. Our approach is based on the theory of residues of multi-logarithmic differential forms with respect to complete intersections. In particular, this allows us to compute the mixed Hodge structure on the cohomology of the complement of divisors of certain types without resorting to the above-mentioned reduction. A general case we then analyze with the use of the residue theory of logarithmic differential forms with respect to arbitrary Cohen-Macaulay varieties.

SC04-01-02

Uniform vector bundles on rational homogeneous spaces

Carolina Araujo[1,a*] and Nicolas Puignau[2]
[1]IMPA, Brazil
[2]UFRJ, Brazil
[a]caraujo@impa.br

2010 *Mathematics Subject Classification.* 14J60, 14M17
Keywords. Rational homogeneous spaces, Uniform vector bundles, Splitting criteria, Minimal rational curves

Let X be a rational homogeneous space. It is well known that X can be embedded in a projective space so that it is covered by lines. A vector bundle on X is said to be uniform if its restriction to any line is the same. Given a vector bundle E on X, a point $x \in X$, and a line $\ell \subset X$ through x, one can construct in a natural way a flag on the fiber of E at x

$$E^1_{x,\ell} \subset E^2_{x,\ell} \subset \cdots \subset E^k_{x,\ell} = E_x.$$

When the vector bundle E is uniform, the dimensions $d_i = \dim E^i_{x,\ell}$ do not depend on the choice of the line ℓ. So one gets a morphism

$$s_{E,x} : H_x \to F(d_1, d_2, \ldots, d_k; E_x)$$

from the space H_x of lines on X through x to the appropriate flag variety. This morphism encodes geometric properties of E. For instance, we show that the morphism $s_{E,x}$ is constant if and only if E splits as a sum of line bundles. This result generalizes and provides a unified proof of several splitting criteria for uniform vector bundles on rational homogeneous spaces.

SC04-08-01

Plane curves with small polar degree

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[1]Saitama university, Japan
[2]Okinawa National College of Technology, Japan
[a]milnorandtjurina@yahoo.co.jp

2010 *Mathematics Subject Classification.* 14H20, 14H50
Keywords. Plane curve, Polar degree, Tjurina number

Let C be a projective plane curve defined by a reduced homogeneus polynomial F in $\mathbb{C}[x, y, z]$. For this C, we consider the polar map

$$\varphi_C : \mathbb{P}^2(\mathbb{C}) \longrightarrow \mathbb{P}^2(\mathbb{C}) \text{ defined by } p \longmapsto \big(F_x(p), F_y(p), F_z(p)\big).$$

We call the degree of φ_C the polar degree of C. The polar degree of is denoted by $\mathrm{Pdeg}\, C$. Dolgachev showed that the curves whose polar degrees are equal to one are an irreducible conic, the union of an irreducible conic and its tangent and the union of three nonconcurrent lines . After his work, we classify the curves whose polar degrees are two, three and four.

SC04-04-01

Smoothing of limit linear series on metrized complex of algebraic curves

Matthew Baker[1], Madhusudan Madhusudan[2,a*], and Luo Ye[1]
[1]Georgia Institute of Technology, United States of America
[2]University of California Berkeley, United States of America
[a]madhu@berkeley.edu

2010 *Mathematics Subject Classification.* 14Q05, 14T05, 14F12, 14G22, 14H55
Keywords. Limit Linear Series of Curves, Semistable curve, Tropical Curves, Smoothing of linear series, Effective Methods for Algebraic Curves

The theory of limit linear series on curves of compact type (reducible curves whose dual graph is a tree) was introduced by Eisenbud and Harris and this notion has many application to algebraic curves. This theory has recently been generalized to objects called "metrized complexes of algebraic curves" by Amini and Baker. A metrized complex of curves is essentially a metric graph with algebraic curves plugged into the vertices of this metric graph. Eisenbud and Harris showed that any limit g^1_d on a curve of compact type can be smoothed to a g^1_d on a smooth curve. We study the question of smoothing a limit g^1_d on a metrized complex. We provide an effective characterization of a smoothable limit g^1_d on a metrized complex and the talk will include various examples demonstrating this characterization. This is work in progress with Matthew Baker and Luo Ye.

SC04-02-03

Some results in resolution of singularities in positive characteristic

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2010 *Mathematics Subject Classification.* 14E15
Keywords. Singularities, positive characteristic, resolution of singularities, Rees algebras, differential operators

Resolution of singularities over fields of characteristic zero was proven in 1964 by H. Hironaka. The proof introduced by Hironaka lies deeply in the existence of hypersurfaces of maximal contact. These hypersurfaces contain the singular locus of the given variety in a very strong way. This fact allows him to reduce, after restriction to one of these hypersurfaces, to a smaller dimensional problem and to start an inductive argument.

It is known that these hypersurfaces of maximal contact don't exist in positive characteristic. In the last years, Villamayor replaces the idea of restriction (to a hypersurface of maximal contact) by considering transversal projections and elimination theory.

Here we will briefly discuss these new ideas and we will show some of the progress done following this direction using the ideas and invariants introduced in some of the papers of the authors. For example, a synthetic proof of resolution of singularities of 2-dimensional schemes, or the characterization of some cases under which one can prove resolution of singularities (e.g., the so called strong monomial case).

SC04-07-01

Defining equations of secant varieties to Veronese reembeddings

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2010 *Mathematics Subject Classification.* 14M12, 14C05, 13H10, 14M17, 15A69
Keywords. Secant variety, catalecticant minors, Veronese variety and Veronese reembeddings, cactus variety, smoothable zero-dimensional schemes

We fix a projective variety $X \subset P^n$ and an integer r. We are interested in the defining equations of the r-th secant variety to the d-uple Veronese reembedding of X, and we assume d is sufficiently large. One of the interesting cases is when $X = P^n$. With these assumptions we prove that the $(r+1)$-minors of the catalecticant matrix with linear entries are sufficient to define the secant variety set-theoretically if and only if the Hilbert scheme parametrising 0-dimensional Gorenstein subschemes of X of length r is irreducible. In particular, if X is smooth and either $\dim X$ is at most 3 or r is at most 13, then the minors are sufficient. If $\dim X$ is at least 4 and r is sufficiently large, then the locus defined by the minors has some extra components. These results motivate introducing cactus varieties, which generalise the secant varieties, and received a lot of attention since then.

SC04-04-02

On Strassen's additivity conjecture

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2010 *Mathematics Subject Classification.* 14Q10, 13P20
Keywords. Waring problems, Waring rank, sums of powers, Strassen, additivity conjecture

Let F be a degree d homogeneous polynomial. The Waring rank of F is the least number of d-th powers of linear forms needed to present F as a sum of them. This minimal number of summand is denote with $\mathrm{rk}(F)$ and it has been object of intense research in the last 10 years. This interest can be explained because of the many applications of the Waring rank which include, but are not limted to, algebraic geometry, algebraic complexity theory, signal processing and quantum information theory. One of the long standing problem about the Waring rank is Strassen's additivity conjecture (1969) which states that $\mathrm{rk}(F+G) = \mathrm{rk}(F)+\mathrm{rk}(G)$ whenever F and G are forms in different sets of variables. Surprisingly, the first non-trivial evidence of this conjecture is contained in a 2012 paper by Carlinni-Catalisano-Geramita in which the additivity of the rank is proved for coprime monomials. In this talk I will show how a new geometric approach leads to a proof of the conjecture in two relevant situations, namely (1) when G has rank at most the number of its variables and (2) when F and G are binary forms, i.e. polynomial involving two variables each. The new techniques that we used are very promising and will allow us to prove Strassen's conjecture even in more cases. This

is work in progress with Catalisano and Chiantini.

SC04-03-02

On the Gevrey expansions of hypergeometric integrals

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2010 *Mathematics Subject Classification.* 14F10, 32C38, 33C70, 35A27
Keywords. Hypergeometric System, Gevrey solution, Irregularity, Hypergeometric integral

This is part of a joint work with Michel Granger which is accepted for publication in IMRN. We study integral representations of the Gevrey series solutions of irregular hypergeometric systems associated with an one row matrix.

Let D denote the complex Weyl algebra of order n, where $n \geq 0$ is an integer.

The input data is a pair (A, β) where $\beta \in \mathbb{C}^d$ and $A = (a_{ij}) \in \mathbb{Z}^{d\times n}$ is a matrix of rank d. The toric ideal $I_A \subset \mathbb{C}[\partial]$ is the ideal generated by the binomials $\partial^u - \partial^v$ where $u, v \in \mathbb{N}^n$ and $Au = Av$. The Hypergeometric System associated with (A, β) is the D–module $M_A(\beta) := \frac{D}{H_A(\beta)}$, where $H_A(\beta)$ is the ideal $DI_A + D(E_1 - \beta_1, \ldots, E_d - \beta_d)$ with $E_i - \beta_i := \sum_{j=1}^n a_{ij}x_j\partial_j$.

Gelfand-Zelevinsky-Kapranov and Adolphson proved that $M_A(\beta)$ holonomic for any (A, β). By results of Hotta, Saito-Sturmfels-Takayama and Schulze-Walther, $M_A(\beta)$ is regular if and only if the toric ideal I_A is homogeneous in $\mathbb{C}[\partial]$.

The irregularity and Gevrey series solutions of an irregular $M_A(\beta)$ are studied and described by Schulze-Walther and Fern√°ndez-Fern√°ndez. A. Adolphson gave a formula for the dimension of the holomorphic solution space at a generic point and for a generic β. A. Esterov and K. Takeuchi prove that these generic solution spaces are described by integral representations along rapid decay cycles as introduced by M. Hien.

In this presentation we will describe a realisation of the Gevrey series solutions of $M_A(\beta)$ as asymptotic expansions of integral solutions, when A is a row matrix.

SC04-03-01

Quasi-numerically positive log canonical divisors

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2010 *Mathematics Subject Classification.* 14E30
Keywords. Quasi-numerically positive, the log canonical divisor, the log abundance conjecture

Here every algebraic variety is projective over the field of complex numbers and every $\mathbb{Q}$-divisor is $\mathbb{Q}$-Cartier.

Definition. A divisor on an algebraic variety is nef if it has nonnegative intersection number with every curve on the variety. It is nup (strictly nef) if it has a strictly positive intersection number with every curve. It is almost nup if it has a strictly positive intersection number with every curve not included in some fixed union of countably many proper Zariski-closed

subsets. It is quasi-nup (of maximal nef dimension) if it is nef and almost nup. It is nef and big if it is nef and its self-intersection number is strictly positive. A divisor on a log variety is nef and log big if it is nef and big and its restriction to every log canonical center is nef and big.

The log abundance conjecture states that, *if the log canonical divisor on a kawamata log terminal (klt) variety is nef, then it is semiample.*

Main Theorem (2012)**.** *The log abundance conjecture is reduced to the following three subconjectures:*
(*Subconjecture 1*) *the existence of some log canonical bundle formula for klt varieties.*
(*Subconjecture 2*) *the termination conjecture for log flips for klt varieties.*
(*Subconjecture 3*) *if the log canonical divisor on a klt variety is quasi-nup, then it is semiample.*

Remark. The proof uses Tsuji's theory of numerically trivial fibrations and Nakayama's theory of numerical Kodaira dimension.

Remark. Subconjecture 1 is now a theorem by Ambro.

Another Theorems.

Theorem 1 (Base point free theorem of Reid type, 1997)**.** *If the log canonical divisor on a $\mathbb{Q}$-factorial divisorial log terminal variety is nef and log big, then it is semiample.*

Theorem 2 (2011)**.** *If the log canonical divisor on a klt variety is numerically equivalent to some semiample $\mathbb{Q}$-divisor, then it is semiample.*

SC04-06-01

Rationality problem for algebraic tori

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2010 *Mathematics Subject Classification.* 11E72, 12F20, 13A50, 14E08, 20C10
Keywords. Rationality problem, birational classification, algebraic tori, flabby resolution, Krull-Schmidt theorem

We give a birational classification of algebraic tori of dimensions 4 and 5 over a field k. In particular, a birational classification of norm one tori whose Chevalley modules are of rank 4 and 5 is given. We show that there exist exactly 487 (resp. 7, resp. 216) stably rational (resp. not stably but retract rational, resp. not retract rational) algebraic tori of dimension 4, and there exist exactly 3051 (resp. 25, resp. 3003) stably rational (resp. not stably but retract rational, resp. not retract rational) algebraic tori of dimension 5. We make a procedure to compute a flabby resolution of a G-lattice effectively by using the computer algebra system GAP. Some algorithms may determine whether the flabby class of a G-lattice is invertible (resp. zero) or not. Using the algorithms, we determine all the flabby and coflabby G-lattices of rank up to 6. Moreover, we show that they are stably permutation. We also verify that the

Krull-Schmidt theorem for G-lattices holds when the rank ≤ 4, and fails when the rank is 5. Indeed, there exist exactly 11 (resp. 131) G-lattices of rank 5 (resp. 6) which are decomposable into two different ranks. Moreover, when the rank is 6, there exist exactly 18 G-lattices which are decomposable into the same ranks but the direct summands are not isomorphic. As an application of the methods developed, some examples of not retract (stably) rational fields over k are given.

SC04-05-02

Toward a complete classification of log del Pezzo surfaces of rank one

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2010 *Mathematics Subject Classification.* 14J25, 14J17, 14J26, 14J45
Keywords. Log del Pezzo surface, quotient singularity, log canonical singularity

After a brief review on the classification of normal del Pezzo surfaces, I will propose an approach to a complete classification of log del Pezzo surfaces of Picard number one. The current stage of this approach will also be presented. In particular, we classify all del Pezzo surfaces of Picard number one with quotient singularities.

SC04-05-01

Birational geometry of algebraic plane curves

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2010 *Mathematics Subject Classification.* 14H50
Keywords. Kodaira dimension, logarithmic Kodaira dimension, minimal model, classification of algebraic surfaces, mixed plurigenera

Let S be a nonsingular rational surface and D a nonsingular curve on S. (S, D) are called pairs and we shall study birational properties of such pairs. Suppose that $m \geq a \geq 1$. Then $P_{m,a}[D] = \dim |mK_S + aD| + 1$ are called mixed plurigenera, which depend on S and D. One can ask to what extent $pairs(S, D)$ are determined by mixed plurigenera. Letting Z stand for $K_S + D$, we see $P_{m,m}[D] = \dim |mZ| + 1$, called *logarithmic plurigenera* of $S - D$, from which logarithmic Kodaira dimension $\kappa[D]$ is introduced.

If $\sigma > 4$ then $D+2K_S$ is nef and big; $P_{2,1}[D] = Z^2 - \overline{g} + 1 = A + 1$, where $A = Z^2 - \overline{g}$;
If $\sigma > 6$ then $|D + 3K_S| \neq \emptyset$ and

$$P_{3,1}[D] = 3Z^2 + 1 - 7\overline{g} + D^2 = 3A - \alpha + 1 = \Omega - \omega + 1$$

where $\alpha = 4\overline{g} - D^2, \Omega = (3Z - 2D) \cdot Z = 3Z^2 - 4\overline{g}$ and $\omega = 3\overline{g} - D^2$.

Our purpose is to eumerate all numerical types of algebraic plane curves with small ω . For instance $\omega < 7$.

Main result. *Given any one of mixed mixed plurigenera, there exist only a finite number of numerical types of (S, D). The pair (Σ_B, C) is said to be # **minimal**, if $\sigma \geq 2\nu_1$ and $e - \sigma \geq B\nu_1$. If a pair (S, D) is not transformed into a line by emona transformations, then*

(i) *(S, D) is obtained from a # minimal pair (Σ_B, C) by shortest resolution of singularities of C using blowing ups or;*
(ii) *$(S, D) = (\mathbf{P^2}, C_d), (d \geq 3)$, C_d being a nonsingular curve.*

Iitaka's web page: http://iitakashigeru.web.fc2.com/

SC04-02-01

Cycles and bundles on generalized complex manifolds

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2010 *Mathematics Subject Classification.* 14D21, 14D20, 14C25
Keywords. Lie algebroid, Generalized complex manifolds, Complex Geometry, Symplectic Geometry, Bundles and Cycles

The generalized complex structures naturally combine the complex geometry and symplectic geometry and extend the mirror behaviour. We study the category of Lie algebroids containing that of generalized complex structures. The category of Lie algebroids are closely related with the category of Lie groupoids. It generalizes the geometry and explains many interesting behaviours. It is also related to diverse physical problems. We study the K groups and algebraic cycles associated to the generalized complex structures from the view point of Lie algebroids and find the Chern character map from K groups to algebraic cycles comparing with those of real versions. We also describe the generalized Grothendieck Riemann Roch theorem and the Picard group from the generalized Hodge theory. We mention the mirror symmetry in the sense of Lie algebroids and Morita equivalence in both K groups and algebraic cycles.

SC04-10-03

Configurations of lines in del Pezzo surfaces and Gosset polytopes

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2010 *Mathematics Subject Classification.* 51M20, 14J26, 14N99, 52B20
Keywords. del Pezzo surface, Gosset polytope, line, ruling

In this talk, we explain the configuration of lines in del Pezzo surfaces according to the E-type reflection group action on Gosset polytopes. After constructing a Goseet polytope in the Picard group of a del Pezzo surface as a convex hull of a subset consisting of lines, we introduce interesting correspondences between special divisors such as lines, rulings, exceptional systems and the subpolytopes in the Gosset Polytope. Moreover, we classify and describe the configuration of the divisor classes of del Pezzo surfaces, which are written as the sum of distinct lines with fixed intersection according to combinatorial data in Gosset polytopes.

SC04-04-03

Additive group actions on algebraic varieties

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2010 *Mathematics Subject Classification.* 14R05, 14R20, 13N15
Keywords. Additive group actions, T-varieties, Automorphism groups

In this talk we present some recent results about algebraic varieties admitting additive group actions.

In the first part, we provide a characterization of additive group actions on a wide class of non-necessarily complete algebraic varieties in terms of a certain type of integrable vector fields. This generalizes the characterization of additive group actions on affine varieties via locally nilpotent derivations.

In the second part, if X is a complete variety such that $\mathrm{Aut}(X)$ is an algebraic group, we show how this characterization allows us to compute the automorphism group of X. We also show how this computations is realized in the case where the maximal torus $T \subseteq \mathrm{Aut}(X)$ is such that $\dim T = \dim X$ or $\dim T = \dim X - 1$.

SC04-01-01

Families of $K3$ surfaces in smooth Fano 3-folds with Picard number 2

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2010 *Mathematics Subject Classification.* 14J28, 14C22, 14E05, 14J10, 14J45
Keywords. Family of $K3$ surfaces, Picard lattice, Birational correspondence

The aim of this talk is to give families of $K3$ surfaces in Fano 3-folds among which there are birational correspondences. We discuss the precise question: if the Néron-Severi lattices of generic members in families of $K3$ surfaces are isometric, then, does there exist a correspondence between general members in one family and those in another? There exists a birational correspondence among families of $K3$ hypersurfaces in weighted projective spaces by Kobayashi and Mase.

Fix a line l and a smooth cubic C in the same hyperplane H in $\mathbb{P}^3$, and denote by $\mathfrak{K}$ a smooth irreducible curve that is an intersection of two smooth cubic surfaces in $\mathbb{P}^3$. Let X', X, and X'' be smooth Fano 3-folds obtained by blowing-up $\mathbb{P}^3$ along l, C, and $\mathfrak{K}$, respectively, and Y be a small toric degeneration of X. Denote by $\mathcal{F}', \mathcal{F}, \mathcal{F}''$, and $\widetilde{\mathcal{F}}$ the families of $K3$ surfaces parametrized by the complete anticanonical linear systems $|-K_{X'}|$, $|-K_X|$, $|-K_{X''}|$, and $|-K_Y|$, respectively. Note that the Néron-Severi lattices of generic member of families $\mathcal{F}', \mathcal{F}, \mathcal{F}''$ are isometric to a lattice $\langle h_1,\, h_2\rangle_{\mathbb{Z}}$ of rank 2 with intersection numbers $(h_1)^2 = 4$, $(h_1.h_2) = 3$, $(h_2)^2 = 0$.

Main Theorem (Mase)**.** *There exist birational maps $\Phi_1 : \mathcal{F}' \to \mathcal{F}$, $\Phi_2 : \mathcal{F}' \to \widetilde{\mathcal{F}}$, $\Phi_3 : \mathcal{F}' \to \mathcal{F}''$ each of that gives a correspondence of general members in respective families.*

Abstract Book - 협업의 문제점

도중에 스마트폰 앱 개발이 추진이 됨. 그렇기 때문에 자료활용을 TEX을 이용해서 작업하게 됨.

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4. 인코딩 문제를 잡아내기 위해 1000쪽에 달하는 원고를 여러번 검토해서 잡아냄.

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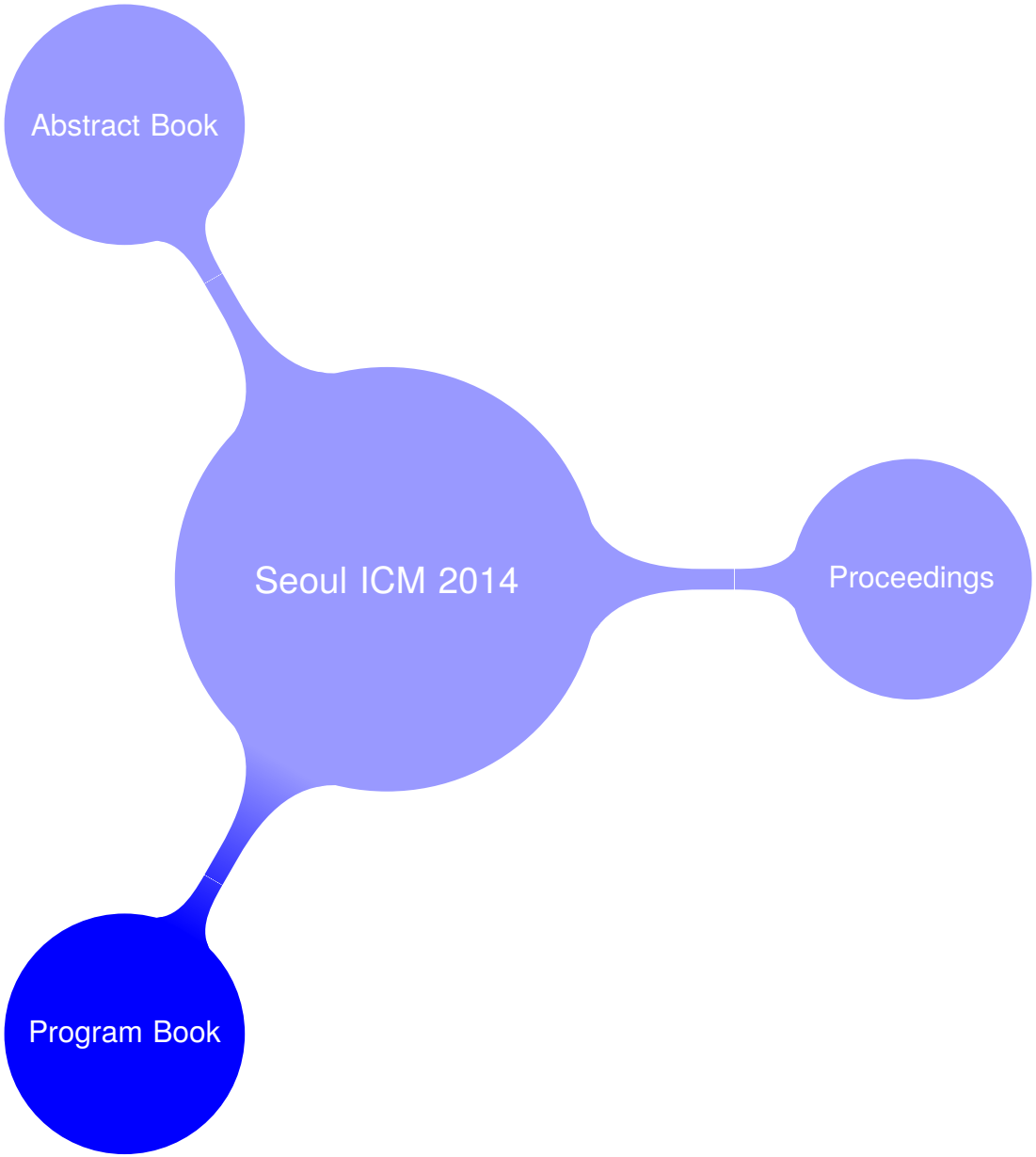
비 TEX유저에게 단순작업을 의뢰할 때는
반드시 TnXTEX이라도 설치해서 작업해야 한다.

Contents



Program Book

ICM Seoul 2014 Program Book (작업기간 : 6월 20일 – 8월 11일)

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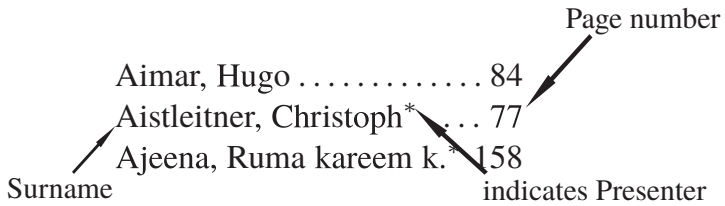
Program Book



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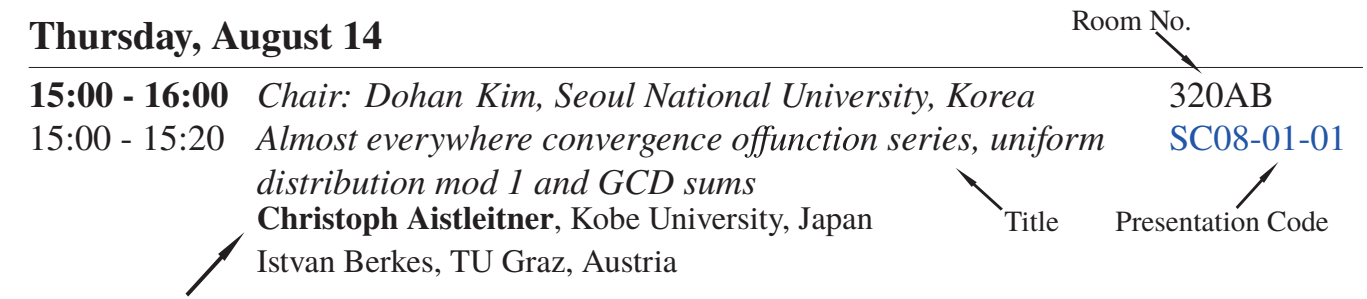

발표 정보

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작업상의 난점

TEX으로 한 이유는?

1. 정보가 실시간으로 바뀌어서 정보의 변화를 바로 적용하기 힘듦.
2. 발표제목에 수식이 많이 들어가있는 상황.
3. 초록집과의 연동을 고려할 때 반드시 TEX으로 조판을 해야 하는 상황

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1. 2단조판은 TEX조판으로 만들 때 많은 기술적인 애로사항이 당시에 있었음 (판면 자유도)

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2. 많은 명령어를 만들어야 하는 상황

사용한 패키지

- (본문) fontspec, hyphenat, enumitem,ragged2e,multicol
- (자료처리) ifthen,pgfkeys,imakeidx
- (객체) graphicx, pdfpages, tikz, tabu, longtable, booktabs, multirow,mdframed,kswrapfig, pagecolor
- Progress source (KNUWorkshop)

사용한 패키지

- 그리고 이 모든것이 TEX으로만 되는 것도 아니므로 Illustrator를 적절히 융합해서 작업.

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- 컴파일러는 파일 연동문제로 LuaLATEX을 사용했다. 파일연동문제는 xr 패키지가 제안되었지만 당시 작업상황 때문에 고육지책으로 LuaLATEX을 사용.

The program by day

Wednesday, August 13

09:00 - 11:30 **Opening Ceremony** **Hall D**

Awards Ceremony of the Fields Medals, the Rolf Nevanlinna Prize, the Carl Friedrich Gauss Prize and the Chern Medal Award

11:30 - 14:00 **Lunch**

14:00 - 16:30 **Laudations** **Hall D**

14:00 - 14:25 Work of Fields Medalist 1

14:30 - 14:55 Work of Fields Medalist 2

15:00 - 15:25 Work of Fields Medalist 3

15:30 - 15:55 Work of Fields Medalist 4

16:00 - 16:25 Work of Rolf Nevanlinna Prize Winner

16:30 - 17:30 **Special Lecture by the Nenvanlinna Prize Winner** **Hall D**

20:00 - 21:00 **Public Lecture 1 by James H. Simons** **Hall D**

Chair: Ki Hyung Lee, CEO of Interpark, Inc., Korea

Thursday, August 14

09:00 - 12:30 **Plenary Lectures** **Hall D**

09:00 - 10:00 *Virtual properties of 3-manifolds* PL-1

Ian Agol, University of California, Berkeley, USA

10:15 - 11:15 *Mori geometry meets Cartan geometry: Varieties of minimal rational tangents* PL-2

Jun-Muk Hwang, KIAS, Korea

11:30 - 12:30 *Mathematics of sparsity (and a few other things)* PL-3

Emmanuel J. Candès, Stanford University, USA

12:30 - 14:00 **Lunch**

14:00 - 15:00 **Special Lecture by Fields Medalist 1** **Hall D**

15:00 - 18:00 **Invited Section Lectures**

15:00 - 18:00 **Short Communications**

12:00 - 18:00 **Poster Sessions** **Hall C1**

18:00 - 19:00 **Emmy Noether Lecture** **Hall D**

Chair: Christiane Rousseau, Université de Montréal, Canada

Connecting the McKay correspondence and Schur-Weyl duality SL-1

Georgia Benkart, University of Wisconsin-Madison, USA

Friday, August 15

09:00 - 12:30 **Plenary Lectures** **Hall D**

09:00 - 10:00 *L-functions and automorphic representations* PL-4

James Arthur, University of Toronto, Canada

10:15 - 11:15 *Hyperbolic P.D.E. and Lorentzian Geometry* PL-5

Demetrios Christodoulou, ETH-Zürich, Switzerland

11:30 - 12:30 *The structure of algebraic varieties* PL-6

János Kollár, Princeton University, USA

12:30 - 14:00 **Lunch**

14:00 - 15:00 **Special Lecture by Fields Medalist 2** **Hall D**

15:00 - 18:00 **Invited Section Lectures**

13. Combinatorics ····· see p.127 318ABC
15. Numerical Analysis and Scientific Computing ··· see p.143 317ABC

15:00 - 18:00 Short Communications

2. Algebra ····· see p.38 309
3. Number Theory ····· see p.49 310AB
5. Geometry ····· see p.60 316
6. Topology ····· see p.68 312
8. Analysis and its Applications ····· see p.86 320AB
9. Dynamical Systems and Ordinary Differential Equations ····· see p.92 324AB
10. Partial Differential Equations ····· see p.103 319
11. Mathematical Physics ····· see p.114 323
12. Probability and Statistics ····· see p.121 322
13. Combinatorics ····· see p.128 321AB
14. Mathematical Aspects of Computer Science ···· see p.139 326
15. Numerical Analysis and Scientific Computing ··· see p.143 325AB
16. Control Theory and Optimization ····· see p.153 311AB
17. Mathematics in Science and Technology ····· see p.160 313

12:00 - 18:00 Poster Sessions **Hall C1**

4. Algebraic and Complex Geometry ····· see p.57
6. Topology ····· see p.73
7. Lie Theory and Generalizations ····· see p.77
8. Analysis and its Applications ····· see p.86

18:00 - 19:00 Abel Lecture **Hall D**

Chair: Helge Holden, Norwegian University of Science and Technology, Norway

Topology through Four Centuries SL-2

John Milnor, Stony Brook University, USA

Saturday, August 16

09:00 - 12:30 Plenary Lectures **Hall D**

09:00 - 10:00 To be announced PL-7
Maryam Mirzakhani, Stanford University, USA

10:15 - 11:15 *The great beauty of VEM's* PL-8
Franco Brezzi, Istituto Universitario di Studi Superiori, Pavia, Italy

11:30 - 12:30 *Rational points on elliptic and hyperelliptic curves* PL-9
Manjul Bhargava, Princeton University, USA

12:30 - 14:00 Lunch

14:00 - 15:00 Lecture on the work of the Gauss Prize winner **Hall D**

15:00 - 18:00 Invited Section Lectures

2. Algebra ····· see p.37 402
4. Algebraic and Complex Geometry ····· see p.54 300
5. Geometry ····· see p.58 Hall E1-4
8. Analysis and its Applications ····· see p.78 Hall E5-6
9. Dynamical Systems and Ordinary Differential Equations ····· see p.91 301AB
11. Mathematical Physics ····· see p.112 307ABC
12. Probability and Statistics ····· see p.119 308ABC
14. Mathematical Aspects of Computer Science ···· see p.138 317ABC
16. Control Theory and Optimization ····· see p.152 318ABC
17. Mathematics in Science and Technology ····· see p.159 327ABC

15:00 - 18:00 Short Communications

2. Algebra ····· see p.38 309
3. Number Theory ····· see p.49 310AB
4. Algebraic and Complex Geometry* ····· see p.55 311AB
5. Geometry ····· see p.60 316
6. Topology ····· see p.68 312
7. Lie Theory and Generalizations ····· see p.75 313
8. Analysis and its Applications ····· see p.86 320AB
9. Dynamical Systems and Ordinary Differential Equations ····· see p.92 324AB
10. Partial Differential Equations ····· see p.103 319
11. Mathematical Physics ····· see p.114 323
12. Probability and Statistics ····· see p.121 322
13. Combinatorics ····· see p.128 321AB
15. Numerical Analysis and Scientific Computing ··· see p.143 325AB
19. History of Mathematics ····· see p.172 326

* end at 18:20

12:00 - 18:00 Poster Sessions **Hall C1**

9. Dynamical Systems and Ordinary Differential Equations ····· see p.99
10. Partial Differential Equations ····· see p.109
11. Mathematical Physics ····· see p.117
12. Probability and Statistics ····· see p.125

Other Activities

18:30 - 19:00 Casual Performances

19:00 - 20:30 Conference Dinner **Hall D**

Hosted by the Mayor of Seoul

Monday, August 18

09:00 - 12:30 Plenary Lectures **Hall D1**

09:00 - 10:00 *Integrable probability* PL-10
Alexei Borodin, Massachusetts Institute of Technology, USA

- *Connection between complemented, continuous, and pure modules.* P02-36
  Sri Wahyuni, Universitas Gadjah Mada (UGM), Indonesia
- *The structure of the unit loops of finite loop algebras of RA2 loops* P02-37
  Swati Sidana, Indian Institute of Technology Delhi, India
  R K Sharma, Indian Institute of Technology Delhi, India
- *Steiner triple systems from algebraic point of view* P02-38
  Izabella Stuhl, University of Sao Paulo, Brazil
- *Type A quiver loci and Schubert varieties* P02-39
  Ryan Kinser, Northeastern University, USA
  Jenna Rajchgot, University of Michigan, USA
- *The quasi-Hopf algebra $Qu_q(sl_2)$* P02-40
  Gongxiang Liu, Nanjing University, China
- *A note on generalizations of quasi-Frobenius rings* P02-41
  Thoang Le duc, Phu Yen University, Vietnam

3. Number Theory

Schedule of Section 3

Room	Day2	Day3	Day4	Day5	Day6	Day7	Day8
	8.14(Thu)	8.15(Fri)	8.16(Sat)	8.18(Mon)	8.19(Tue)	8.20(Wed)	8.21(Thu)
Hall E1-4	IL3.1 IL3.2 IL3.3	IL3.4 IL3.5 IL3.6				IL3.10 IL3.11 IL3.12	
307ABC					IL3.7 IL3.8 IL3.9		
310AB		SC03-01 SC03-02 SC03-03	SC03-04 SC03-05 SC03-06	SC03-07 SC03-08 SC03-09	SC03-10 SC03-11		
Hall C1	P03						

IL: Invited Section Lectures, SC: Short Communications, P: Poster Sessions

Invited Section Lectures

Thursday, August 14

15:00 - 17:45 *Chair: YoungJu Choie, POSTECH, Korea* **Hall E1-4**

15:00 - 15:45 *The ternary Goldbach problem* IL3.1
Harald Andrés Helfgott, École Normale Supérieure-Paris, France

16:00 - 16:45 *Completed cohomology and the p-adic Langlands program* IL3.2
Matthew Emerton, University of Chicago, USA

17:00 - 17:45 *Motivic periods and $\mathbb{P}\backslash\{0,1,\infty\}$* IL3.3
Francis Brown, IHES, France

Friday, August 15

15:00 - 17:45 *Chair: Ja-Kyung Koo, KAIST, Korea* **Hall E1-4**

15:00 - 15:45 *Small gaps between primes* IL3.4
D. A. Goldston, San Jose State Univeristy, USA
Janos Pintz*, Alfréd Rényi Institute of Mathematics, Hungary
Cem Yalcin Yıldırım, Bogazici University, Turkey

16:00 - 16:45 *Automorphic Galois representations and the cohomology of Shimura varieties* IL3.5
Michael Harris, Institut de Mathématiques de Jussieu, France

17:00 - 17:45 *Theta correspondence: recent progress and applications* IL3.6
Wee Teck Gan, National University of Singapore, Singapore

Tuesday, August 19

15:00 - 17:45 *Chair: Byeong-Kweon Oh, Seoul National University, Korea* **307ABC**

15:00 - 15:45 *Translation invariance, exponential sums, and Waring's problem* IL3.7
Trevor D. Wooley, University of Bristol, UK

16:00 - 16:45 *Perfectoid spaces and their applications* IL3.8
Peter Scholze, Universität Bonn, Germany

17:00 - 17:45 *Some problems in analytic number theory for polynomials over a finite field* IL3.9
Zeev Rudnick, Tel Aviv University, Israel

Wednesday, August 20

15:00 - 17:45 *Chair: Henri Darmon, Canada, McGill University* **Hall E1-4**

15:00 - 15:45 *Stabilisation de la partie géométrique de la formule des traces tordue* IL3.10
Jean-Loup Waldspurger, Institut de Mathématiques de Jussieu, France

16:00 - 16:45 *Elementary integration of differentials in families and conjectures of Pink* IL3.11
Umberto Zannier, Scuola Normale Superiore di Pisa, Italy

17:00 - 17:45 *Linear equations in primes and dynamics of nilmanifolds* IL3.12
Tamar Ziegler, Hebrew University and Technion, Israel

Thursday, August 21

14:00 - 15:00 *Chair: Myung-Hwan Kim, Seoul National University, Korea* **Hall D1**

14:00 - 15:00 *Small gaps between primes and primes in arithmetic progressions to large moduli* IL3.13
Yitang Zhang, University of New Hampshire, USA

Short Communications

Friday, August 15

15:00 - 16:00 *Chair: Byeong-Kweon Oh, Seoul National University, Korea* **310AB**

15:00 - 15:20 *On a generalization of the three-pile trick by means of a finite family of discrete functions* SC03-01-01
Roy Quintero, Universidad de Los Andes, Venezuela

15:20 - 15:40 *Chebyshev polynomials over finite fields and periodic harmonic functions on lattices* SC03-01-02
Masakazu Yamagishi, Nagoya Institute of Technology, Japan

15:40 - 16:00 *Connections between the sum of divisors function and Euler's totient function* SC03-01-03
Kevin Broughan, University of Waikato, New Zealand

16:00 - 17:00 *Chair: Masakazu Yamagishi, Nagoya Institute of Technology, Japan* **310AB**

16:00 - 16:20 *Cauchy Riemann equations of Zeta function* SC03-02-01
David Ni, Direxion Technology, Chinese Taipei

16:20 - 16:40 *Generalized trigonometric Hopf algebras and Fermat's last theorem* SC03-02-02
Stefan Catoiu, DePaul University, Chicago, USA

16:40 - 17:00 *Metabelian groups, transfer maps, and the capitulation problem* SC03-02-03
Alexandru Tupan, University of Wisconsin River Falls, USA

17:00 - 18:00 *Chair: Stefan Catoiu, Depaul University, USA* **310AB**

17:00 - 17:20 *A new class of ordinary integers* SC03-03-01
Shu-Yuan Mei, Nanjing Normal University, China

17:20 - 17:40 *Computing bounds on Jacobsthal's function* SC03-03-02
Gerhard Paseman, Sheperd Systems, USA

17:40 - 18:00 *Hegyvári's theorem on complete sequences* SC03-03-03
Yong-Gao Chen, Nanjing Normal University, China
Jin-Hui Fang, Nanjing University of Information Science & Technology, China

Saturday, August 16

15:00 - 16:00 *Chair: Chang Heon Kim, Hanyang University, Korea* **310AB**

15:00 - 15:20 *Powers in products of terms of Pell's and Pell-Lucas Sequences* SC03-04-01
Shanta Laishram, Indian Statistical Institute, India
Jhon Bravo, UNAM, Morelia, Mexico
Pranabesh Das, Indian Statistical Institute, India
Segio Guzman, UNAM, Morelia, Mexico

15:20 - 15:40 *Arithmetic of Sheffer sequences* SC03-04-02
Dae San Kim, Sogang University, Korea
Taekyun Kim, Kwangwoon University, Korea

15:40 - 16:00 *Solutions of the Diophantine equation $x^2 + 5^a \cdot p^b = y^n$* SC03-04-03
Musa Demirci, Uludag University, Turkey

16:00 - 17:00 *Chair: Dae San Kim, Sogang University, Korea* **310AB**

16:00 - 16:20 *On the algebraicity of the Fourier coefficients of half-integral weight modular forms* SC03-05-01
Venkata ganapathi narasimha kumar Cheraku, Indian Institute of Technology Hyderabad, India
Soma Purkait, University of Warwick, UK

16:20 - 16:40 *Siegel modular forms of weight two and Hurwitz quaternion* SC03-05-02
Haigang Zhou, Tongji University, China

16:40 - 17:00 *On generic local Langlands correspondence for GSpin groups* SC03-05-03
Volker Heiermann, Aix Marseille Universite, CNRS, Centrale Marseille, France
Yeansu Kim, University of Iowa, USA

17:00 - 18:00 *Chair: Yeansu Kim, University of Iowa, USA* **310AB**

17:00 - 17:20 *Generalizing Wallis formula* SC03-06-01
Dirk Huylebrouck, KU Leuven, Belgium

17:20 - 17:40 *Fourier expansion and a combinatorial-geometric viewpoint of Knopp type identities for generalized Dedekind sums* SC03-06-02
Kozuka Kazuhito, Miyakonojo National College of Technology, Japan

17:40 - 18:00 *Group sieve method for sequences of Fibonacci type* SC03-06-03
Peide Chen, Chinese Academy of Sciences, China

Monday, August 18

15:00 - 16:00 *Chair: Ilhan Ikeda, Yeditepe University, Turkey* **310AB**

15:00 - 15:20 *Exceptional intercepts of linear mod one transformations and fractional parts $\{\xi(p/q)^n\}$* SC03-07-01
Doyong Kwon, Chonnam National University, Korea

15:20 - 15:40 *Generalizations of a cotangent sum associated to the zeros of the Estermann zeta function* SC03-07-02
Michael Rassias, ETH-Zurich, Switzerland

15:40 - 16:00 *3D continued fractions and Kloosterman sums* SC03-07-03
Alexey Ustinov, Institute of Applied Mathematics, Russia

16:00 - 17:00 *Chair: Doyong Kwon, Chonnam National University, Korea* **310AB**

16:00 - 16:20 *On the zeros of the k-th derivative of the Riemann zeta function under the Riemann hypothesis* SC03-08-01
Ade Irma Suriajaya, Nagoya University, Japan

16:20 - 16:40 *Some conjecture on divisor function* SC03-08-02
Masatoshi Nakano, The Mathematical Society of Japan, Japan

16:40 - 17:00 *How to prove the Riemann hypothesis* SC03-08-03
Yuanyou Cheng, Harvard University, USA

17:00 - 18:00 *Chair: Ade Irma Suriajaya, Nagoya University, Japan* **310AB**

17:00 - 17:20 *The asymptotic behavior of the multiple zeta function at non-positive integers* SC03-09-01
Tomokazu Onozuka, Nagoya University, Japan

17:20 - 17:40 *Meromorphic continuation and natural boundary for a new class of Euler products* SC03-09-02
Oswaldo Velasquez, Universidad Nacional de Ingenieria, Peru
Driss Essouabri, Universite Jean Monnet - Saint Etienne, Peru

17:40 - 18:00 *On a group closely related with the automorphic Langlands group* SC03-09-03
Ilhan Ikeda, Yeditepe University, Turkey

Tuesday, August 19

15:00 - 16:00 *Chair: Bo-Hae Im, Chung-Ang University, Korea* **310AB**

15:00 - 15:20 *Holomorphic differentials of cyclotomic function fields* SC03-10-01
Kenneth Ward, New York University Shanghai, China

15:20 - 15:40 *Galois codescent for motivic tame kernels* SC03-10-02
Jilali Assim, Moulay Ismail University, Morocco

15:40 - 16:00 *Motivic Riemann-Roch theorem for nonsmooth schemes* SC03-10-03
Alberto Navarro, ICMat, Spain

16:00 - 17:00 *Chair: Kenneth Ward, New York University Shanghai, China* **310AB**

16:00 - 16:20 *Euler products beyond the boundary for Selberg zeta functions* SC03-11-01
Shin-ya Koyama, Toyo University, Japan
Fumika Suzuki, The University of British Columbia, Canada

16:20 - 16:40 *An arithmetic of hyperbolic curve over finite fields* SC03-11-02
Kai-Rui Wang, Yunnan University, China
Cheng-Xi Wang, Beijing Normal University, China
Xiao-Qin Liu, Yunnan University, China
Qi Zheng, Yunnan University, China

16:40 - 17:00 *Minimum degree of the difference of two polynomials over $\mathbb{Q}$, and weighted plane trees* SC03-11-03
Fedor Pakovich, Ben Gurion University, Israel
Alexander Zvonkin, Bordeaux University, France

Poster Sessions

Thursday, August 14

12:00 - 18:00 **Hall C1**

- *Fermat's last theorem and convex regular polytopes* P03-01
  Aseem Bhagwat, Indian Statistical Institute, India
- *A new elementary approach to Fermat's last theorem* P03-02
  Aseem Bhagwat, Indian Statistical Institute, India
- *Constacyclic codes over finite fields* P03-03
  Madhu Raka, Panjab University, Chandigarh, India
- *On a classical conjecture of Minkowski* P03-04
  Leetika Kathuria, Panjab University, Chandigarh, India
  Madhu Raka, Panjab University, Chandigarh, India
- *On some characterizations of arithmetical functions* P03-05
  Debashis Bhattacharjee, North-Eastern Hill University, India
- *Was Pierre Fermat wrong?* P03-06
  Albert Khabelashvili, Member of the seminar on history of mathematics, Russia
- *The prime sextuplets are infinite* P03-07
  Jiaji Qiu, Beijing Tiantan Hospital, China
  Runmin Qiu, Nanchang City, Jiangxi Province, China
- *Prime number has regular patterns* P03-08
  Letian Ma, Ciming health, China
- *Group sieve for sequence of exponential type* P03-09
  Haoling Hou, Sun Yat-sen University, China
- *Group sieve for sequences of iterative type* P03-10
  Wenxiang Cai, University of Waterloo, Canada
- *Monogeneity of totally real algebraic extension fields over a cyclotomic field* P03-11
  Nadia Khan, FAST National university peshawar campus, Pakistan
  Shin-ichi Katayama, University of Tokushima, Japan
  Toru Nakahara, FAST National university peshawar campus, Pakistan
  Tsuyoshi Uehara, Saga University, Japan
- *On the fundamental units and a lower estimate of the class numbers of real quadratic fields* P03-12
  Rabia Qureshi, FAST National Uiversity of Computer and Emerging Sciences, Pakistan

Toru Nakahara, FAST National Uiversity of Computer and Emerging Sciences, Pakistan
Syed Inayat Ali Shah, Islamia College University, Pakistan

- *Self-dual extended split group codes* P03-13
  Lilibeth Valdez, University of the Philippines, Philippines
  Aldrin Ocampo, Far Eastern University, Philippines
- *A new identity which Ramanujan probably missed* P03-14
  Susil Kumar Jena, KIIT University, India
- *On Galois cohomology of reductive groups over global function fields and its applications* P03-15
  Quoc Thang Nguyen, Institute of Mathematics, Vietnam
- *Prime number generation and factor elimination* P03-16
  Vineet Kumar, Indian Institute of Technology, BHU, India
- *Ring extensions and primality* P03-17
  Tony Ezome, Université des Sciences et Techniques de Masuku (USTM), Gabon
- *An application of measure theory to the digital sum problems for certain code* P03-18
  Tatsuya Okada, Fukushima Medical University, Japan

4. Algebraic and Complex Geometry

Schedule of Section 4

Room	Day2	Day3	Day4	Day5	Day6	Day7	Day8
	8.14(Thu)	8.15(Fri)	8.16(Sat)	8.18(Mon)	8.19(Tue)	8.20(Wed)	8.21(Thu)
300			IL4.4 IL4.5 IL4.6				
301AB	IL4.1 IL4.2 IL4.3						
307ABC				IL4.7 IL4.8 IL4.9 IL4.10			
311AB			SC04-01 SC04-02 SC04-03		SC04-04 SC04-05 SC04-06 SC04-07	SC04-08 SC04-09 SC04-10	
Hall C1		P04					

IL: Invited Section Lectures, SC: Short Communications, P: Poster Sessions

Other Information

Congress Information

Venue

COEX
159 Samseong-dong, Gangnam-gu
135-731 Seoul, Korea
Phone: + 82-2-6000-0114
Website: www.coex.co.kr

Official Language

English

Registration

- Location 3F Hall D1 Lobby
- Operating Hours

17:00-19:00	August 11 (Mon)
09:00-19:00	August 12 (Tue)
07:00-20:30	August 13 (Wed)
08:00-18:00	August 14 (Thu)-15 (Fri)
08:00-19:00	August 16 (Sat)
09:00-18:00	August 18 (Mon)-19 (Tue)
09:00-20:30	August 20 (Wed)
09:00-15:00	August 21 (Thu)

*Please note that access to the Opening Ceremony on August 13 will only be granted to participants with a passport (foreigner) and/or an Identification Card (Korean) for security reasons. We strongly recommend participants to enter the Hall with minimum luggage for the sake of security clearance.

Congress Souvenir

- Location 3F Hall D1 Lobby
- Types of Souvenir
  T-shirt, fan, umbrella, tumbler, three types of posters, commemorative stamps
- Service Hours

09:00-18:00	August 14 (Thu)-20 (Wed)
09:00-15:00	August 21 (Thu)

*Closed on August 17(Sun)

Preview Room

Short Communications (Oral) Presenters are requested to confirm arrival and deliver the latest version of their presentation material stored in a USB, a CD-Rom and/or a DVD to the preview room at least 24 hours before their designated presentation session.

- Location 3F 314
- Operating Hours

14:00-18:00	August 12 (Tue)
08:30-18:00	August 13 (Wed)-20 (Wed)

Invited Speakers' Room

Plenary Speakers, Invited Speakers and Invited Panels are requested to confirm arrival and deliver the latest version of their presentation material stored in a USB, a CD-Rom and/or a DVD to the Invited Speakers' Room at least 24 hours before their designated presentation session.

- Location 3F 315
- Operating Hours

14:00-18:00	August 12 (Tue)
08:30-18:00	August 13 (Wed)-20 (Wed)
08:30-12:00	August 21 (Thu)

Lunch & Coffee

Complementary Lunch

A sandwich box will be provided for lunch from 11:20 to 12:30, August 13th, in Hall C2 and C3 (3F).

Paid Lunch

Participants may have lunch by using a coupon in hall C2 and C3 (3F) beginning on August 13th. Lunch coupons will be sold in the Hall D Lobby (3F).

- Service Hours for Lunch Coupon
  10:00-17:00 August 13 (Wed)-19 (Tue)
- Service Hours for Lunch Distribution
  12:30-14:00 August 13 (Wed)-19(Tue)

* Closed on August 17(Sun).

Coffee

- Service Hours

15:45-16:40 August 13 (Wed)	Hall C2+3
9:50-10:20 / 15:45-16:40 August 14 (Thu)-19 (Tue)	Hall C2+3
15:45-16:40 August 20 (Wed)	Hall D1 Lobby 3F Conference Room
9:50-10:20 August 20 (Wed)-21(Thu)	Hall D1 Lobby

NANUM Reimbursement Room

- Location 3F 304(ICM)
  3F 305(KIAS)
- Operating Hours

13:00-19:00	August 14 (Thu)-16 (Sat)
13:00-19:00	August 18 (Mon)-20 (Wed)

NANUM is a Korean word meaning "gracious and unconditional sharing"

NANUM Networking

- Date
  August 13 (Wed) Latin America
  August 14 (Thu) Africa, Eastern European
  August 15 (Fri) Asia
- Location 4F 403
- Time 17:00-18:30

Media Center & Interview Room

- Location 2F 203 (Media Center),
  2F 205/206 (Interview Room)
- Operating Hours
  09:00-18:00 August 12 (Tue)-16 (Sat)
  09:00-18:00 August 18 (Mon)-21 (Thu)

*Closed on August 17(Sun)

Internet Lounge

- Location 3F Hall C1
- Service Hours
  13:00-18:00 August 13 (Wed)
  09:00-18:00 August 14 (Thu)-20 (Wed)

*Closed on August 17(Sun)
Free Wi-fi : COEX Free Wi-fi Zone

Cloak Room

- Service Hours

14:00-22:00 August 12 (Tue)	2F 208
09:00-19:00 August 13 (Wed)	2F 208A
09:00-19:00 August 14 (Thu)-20 (Wed)	3F Hall D1 Lobby Kit Distribution
09:00-17:00 August 21 (Thu)	2F 208

Childcare Service

- Age 4-8 years old
- Location 2F 207A
- Operating Hours
  09:00-18:00 August 12 (Tue)-21 (Thu)
- Daily Fees
  - Registration Fee (non-refundable)
    USD 50 / KRW 50,000 per household
  - Hourly Fee
    USD 15 / KRW 15,000 per hour and per child
  - After 18:00, a late fee of USD 10 (or KRW 10,000) per child for every 10 minutes will be charged. Childcare Service Center closes at 19:00.

Prayer Room

- Location 3F Hall C1
- Service Hours
  13:00-18:00 August 13 (Wed)
  09:00-18:00 August 14 (Thu)-20 (Wed)

*Closed on August 17(Sun)

First Aid

- Location 3F 303
- Service Hours
  09:00-18:00 August 12 (Tue)-16 (Sat),
  August 18 (Mon)-20 (Wed)
  09:00-16:00 August 21 (Thu)

*Closed on August 17(Sun)

Official & Social Events

Welcome Reception

- Location 1F Grand Ballroom
- Date & Time 18:00-21:00 August 12 (Tue)

* Fingerfoods and drinks will be served.

Opening Ceremony

- Location 3F Hall D
- Date & Time 09:00-11:35 August 13 (Wed)

*Please note that access to the Opening Ceremony on August 13 will only be granted to participants with a passport (foreigner) and/or an Identification Card (Korean) for security reasons. We strongly recommend participants to enter the Hall with minimum luggage for the sake of security clearance. Participants will be asked to be seated by 08:00.

Conference Dinner

- Location 3F Hall D
- Date & Time 19:00-20:30 August 16 (Sat)

*Hosted by the Mayor of Seoul

Closing Ceremony

- Location 3F Hall D1
- Date & Time 15:00-16:30 August 21 (Thu)

Cultural Events

Public Lecture 1

- Speaker James H. Simons
- Language English (Korean subtitle)
- Location 3F Hall D
- Date & Time 20:00-21:30 August 13 (Wed)

Public Lecture 2

- Speaker Leelavati Prize Winner
- Language English (Korean subtitle)
- Location 3F Hall D1
- Date & Time 20:00-21:30 August 20 (Wed)

Baduk Program

- Public Baduk Lecture
- Location 4F 401
- Date & Time 15:00-16:40 August 19 (Tue)
- Public Baduk Event
- Location 4F 401 Lobby
- Date & Time 16:10-18:00 August 19 (Tue)
- Simultaneous games with professional Baduk players
- Location 4F 403
- Date & Time 16:00-18:00 August 19 (Tue)

Math Movie Screening

- Title How I Came to Hate Maths
- Location 3F Hall D1
- Date & Time 17:30-20:30 August 19 (Tue)

Poster Sessions

For poster presenters, the organizing committee will provide a series of poster display boards. Posters should be affixed to the poster boards using double-sided adhesive tapes. It is recommended to bring your own stationeries in case of depletion of the prepared stationeries. There is no audio-visual equipment available for poster presentations.

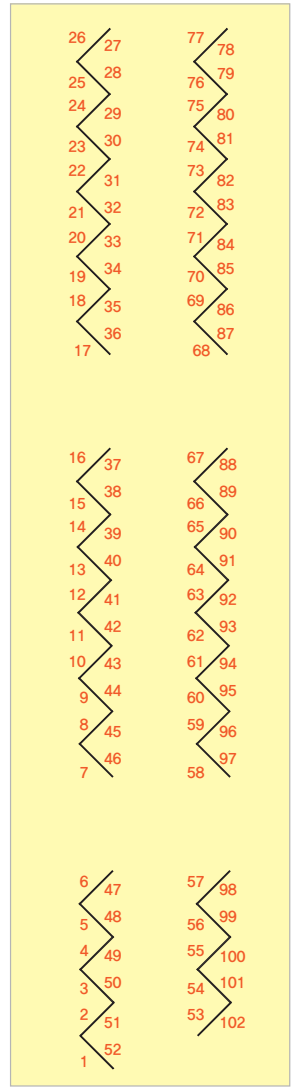
- Location 3F Hall C1
- Date August 14 (Thu)-16 (Sat)
  August 18 (Mon)-19 (Tue)
- Schedule

Mounting	11:00 - 12:00
Poster Display	12:00 - 18:00
Standing (Presenters)	16:00 - 17:00
Removal	18:00 - 19:00

*Our staff will guide you to the display area.

*Poster Code
P(Section Code)-(Poster Code) ex) P01-01

Lay-out ➡



List of Exhibitors

Exhibition Information

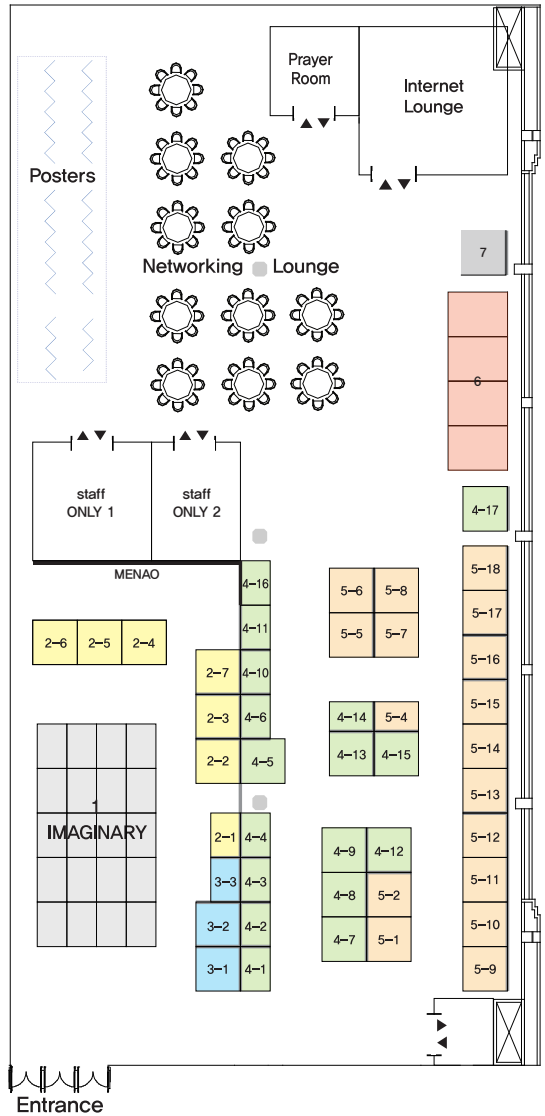
- Place 3F Hall C1
- Schedule August 13 (Wed) 13:00 - 18:00
  August 14 (Thu) - 20 (Wed) 09:00 - 18:00

*No Exhibition on August 17 (Sun)

Exhibitors

ZONE	EXHIBITOR	BOOTH No.
1. IMAGINARY	National Institute of Mathematical Sciences (NIMS) Mathematisches Forschungsinstitut Oberwolfach (MFO)	1
2. Teaching Materials	Math Donga	2-1
	MATH NOTE	2-2
	KyoWooSa KyoWoo Media	2-3
	MAGFORMERS	2-4,5,6
	HENAMU	2-7
3. Software	WOLFRAM RESEARCH	3-1
	CYBERNET SYSTEMS KOREA	3-2
	MATHSOFTWARE.ORG	3-3
4. Academic	KIAS	4-1
	IBS CENTER FOR GEOMETRY & PHYSICS	4-2
	EUROPEAN RESEARCH COUNCIL	4-3
	zbMATH - FIZ KARLSRUHE	4-4
	EUROPEAN MATHEMATICAL SOCIETY	4-5
	HEIDELBERG LAUREATE FORUM FOUNDATION	4-6
	AMERICAN MATHEMATICAL SOCIETY	4-7,8,9
	CIRM*SMF*CNRS	4-10
	LONDON MATHEMATICAL SOCIETY	4-11,16
	ICM2018	4-12
	INTERNATIONAL MATHEMATICAL UNION	4-13
	MATHEMATICAL SOCIETY OF JAPAN	4-14
	"RESEARCH IN EUROPE" (DE, NL, ES, UK)	4-15
	KOREAN MATHEMATICAL SOCIETY	4-17
5. Publishing	OXFORD UNIVERSITY PRESS	5-1,2
	PROJECT EUCLID	5-4
	ELSEVIER	5-5,6
	CAMBRIDGE UNIVERSITY PRESS	5-7,8
	SPRINGER	5-9,10,11,12
	CRC PRESS/TAYLOR & FRANCIS	5-13,14,15
	SEUNGSAN PUBLISHERS	5-16
	KYUNGMOONSA CO.,LTD.	5-17,18
6. Korean Culture Experiencing	KOREA TOURISM ORGANIZATION	6
7. Souvenir	NATIONAL SOUVENIR CENTER	7

Floor Plan



Tour Programs

Participants are cordially invited to join optional tours in and around Seoul. Onsite reservation for tour programs can be made until 12:00 p.m. 3 days before the tour day in 3F Hall D Lobby (Tour Desk).
*Only extra seats will be sold.

No.	Tour Name	Date
DMZ 1	DMZ and War Museum Tour (08:00-17:00)	August 13-17,19-21
DMZ 2	DMZ afternoon Tour (12:00-18:30)	August 12,17,21,22
HT 1	Morning Palace Tour (09:00-13:30)	August 13,15,17,20
HT 2	World Cultural heritage Tour (12:00-18:00)	August 13,15,17,20
HT 3	Tower, Hanok village Tour (09:00-13:30)	August 14,17,18
HT 4	Afternoon Shopping & Palace Tour (12:00-17:30)	August 14,16,17
HT 5	Morning Museum Tour (09:00-13:30)	August 14,16,17
FT 1	Traditional attractions Tour (HT1+HT2) (09:00-18:00)	August 13,15,17,20
FT 2	Seoul's yesterday and today Tour (HT3+HT4) (09:00-17:30)	August 14,16,17
FT 3	Back to Ancient Korea (09:00-17:00)	August 15,17,19
FT 4	Top attractions of Seoul (09:00-19:00)	August 20-22
ET 1	Taekwondo Tour (09:00-13:30)	August 14,20
ET 2	Korean Mask making, Dongdaemun Tour (12:30-18:00)	August 12,17,21
ET 3	Temple Life of Korea (09:00-16:00)	August 17,19
ET 4	Kimchi Making, Hanbok wearing Tour (12:30-17:30)	August 16,18
NT 1	Dinner Buffet Cruise Tour (18:00-22:00)	August 12,16,17,20,21
NT 2	Into Korean's real life (18:00-22:00)	August 13-15,18,19
FMT 1	Everland Tour (09:00-18:00)	August 14,15,17,20
FMT 2	Korean Folk Village (09:00-15:00)	August 13,16,18,19,21

Abbreviation Guide: DMZ Tour (DMZ), Half Day Tour (HT), Full day Tour (FT), Experience Tour (ET), Night Tour (NT), Family Tour (FMT).
*** All tour programs are subject to cancellation if the minimum 20 persons is not met.**

DMZ Tour


Half Day Tour


Family Tours

Accommodations

List of Hotels

[1] Grand Intercontinental Seoul Parnas
- Address: 521, Teheran-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-555-5656
- Website: https://www.grandicparnas.com:444/eng/index.do

[2] Intercontinental Seoul COEX
- Address: 524, Bongeunsa-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-3452-2500
- Website: www.iccoex.com/eng/index.do

[3] Oakwood Premier COEX Center Seoul
- Address: 46, Teheran-ro 87-gil, Gangnam-gu, Seoul, Korea
- Phone: +82-2-3466-7000
- Website: www.oakwoodpremier.co.kr/?view=main&mode=hub_eng

[4] Renaissance Seoul Hotel
- Address: 237, Teheran-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-555-0501
- Website: www.marriott.com/hotels/travel/selrn-renaissance-seoul-hotel/

[5] Lotte Hotel World
- Address: 240, Olympic-ro, Songpa-gu, Seoul, Korea
- Phone: +82-2-419-7000
- Website: www.lottehotel.com/world/ko/

[6] Imperial Palace Hotel
- Address: 248-7, Nonhyeon 2-dong, Gangnam-gu, Seoul, Korea
- Phone: +82-2-3440-8000
- Website: www.imperialpalace.co.kr/eng/index.asp

[7] Sheraton Grande Walkerhill Hotel
- Address: 177, Walkerhill-ro, Gwangjin-gu, Seoul, Korea
- Phone: +82-2-455-5000
- Website: www.sheratonwalkerhill.co.kr/en/main.wh

[8] Novotel Ambassador Gangnam
- Address: 130, Bongeunsa-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-567-1101
- Website: novotel.ambatelen.com/gangnam/main.amb

[9] JW Marriott Seoul
- Address: 19-3, Banpo 4-dong, Seocho-gu, Seoul, Korea
- Phone: +82-2-6282-6262
- Website: www.jw-marriott.co.kr/eng/

[10] Riviera Hotel
- Address: 737, Yeongdong-daero, Gangnam-gu, Seoul, Korea
- Phone: +82-2-541-3111
- Website: www.hotelriviera.co.kr/eng/index.asp

[11] Mercure Seoul

- Address: 10, Teheran-ro 25-gil, Gangnam-gu, Seoul, Korea
- Phone: +82-2-2050-6000
- Website: www.mercureseoul.com/eng/main/main.asp

[12] Ramada Seoul Hotel

- Address: 410, Bongeunsa-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-6202-2000
- Website: www.ramadaseoul.co.kr/eng/default.asp

[13] Ellui Hotel

- Address: 551, Dosan-daero, Gangnam-gu, Seoul, Korea
- Phone: +82-2-514-3535
- Website: www.ellui.com/english/main/main.asp

[14] Best Western Premier Gangnam

- Address: 139, Bongeunsa-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-6474-2000
- Website: www.bestwesterngangnam.com/

[15] Samjung Hotel

- Address: 150, Bongeunsa-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-557-1221
- Website: www.samjunghotel.co.kr/eng/

[16] IBIS Ambassador Seoul

- Address: 431, Samseong-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-3454-1101
- Website: ibis.ambatelen.com/seoul/main.amb

[17] Casaville Samsung (Serviced Residence)

- Address: 13, Teheran-ro 92-gil, Gangnam-gu, Seoul, Korea
- Phone: +82-2-539-9080
- Website: www.casavillesamsung.co.kr/main/index.php

[18] Gangnam Serviced Residence (Serviced Residence)

- Address: 143, Bongeunsa-ro, Gangnam-gu, Seoul, Korea
- Phone: +82-2-6474-1515
- Website: www.gangnamresidence.com/eng/

List of Dormitories

Soongsil University (Residence Hall)

- Address: Sangdo-ro 369, Dongjak-gu, Seoul, Korea
- Location: Subway LINE 7 Soogsil Univ. Station
- Phone: +82-2-2621-0100/0200/0300/0400
- Website:ssudorm.ssu.ac.kr/

Konkuk University (KU:L House)

- Address: 120 Neongdong-ro, Gwangjin-gu, Seoul, Korea
- Location: Subway LINE 2, 7 Konkuk Univ. Station
- Phone: +82-2-2024-5000
- Website:kulhouse.konkuk.ac.kr/home/lan/eng/e_index_01.asp

Useful Information

Useful Phone Numbers

If you have any inquiry during the congress, please contact number below.

SERVICE	CONTACT NUMBER
COEX (Venue)	02-6000-0114
Intercontinental Seoul COEX Hotel	02-3452-2500
Grand Intercontinental Seoul Parnas Hotel	02-555-5656
Konkuk University (KU:L House)	010-7299-8825
Soongsil University (Residence Hall)	010-5476-3940
Police	112
Emergency Service (Fire and Ambulance)	119
International Call Operator (08:00-22:00)	00799
Tourist Information	1300

• From Abroad: Be sure to the drop 0 in front of area
• +82: Country code

Climate

Korea has four distinct seasons- spring, summer, fall, and winter. The average temperature of Seoul in August is 28°C (82.4°F). Although the temperature may be high, there may be some rain, so you may need an umbrella or a rain jacket.

Currency & Credit Cards

The unit of Korean currency is South Korean Won (KRW). Korean monetary units are KRW10, KRW50, KRW100, and KRW500 coins, and KRW1,000, KRW5,000, KRW10,000 and KRW50,000 notes. For higher denominations, negotiable cashier's checks are used. Most credit cards (e.g. VISA, MasterCard, American Express and Diners Club) are widely accepted in Seoul.

Language

The official language of Korea is Korean. English is widely spoken in Seoul.

Insurance and Liability

The SEOUL ICM 2014 Organizing Committee will not be responsible for any medical expenses, accidents, or losses or unexpected property damages of congress participants either during or as a result of the congress or during any tours or events. Participants are strongly advised to arrange their own travel insurance for health and accidents, lost luggage, and trip cancellations.

Time Difference

Korea Standard Time is 9 hours ahead of Greenwich Mean Time (GMT +9). Korea does not observe daylight saving time.

Business Hours

Government offices are open from 9:00 a.m. to 6:00 p.m. on weekdays only. Bank hours are from 9:00 a.m. to 4:00 p.m. on weekdays and closed on weekends. Foreign diplomatic missions in Seoul are usually open from 9:00 a.m. to 5:00 p.m. on weekdays and closed on Saturdays, Sundays and their respective national holidays.

Electricity

The standard electricity supply is 220 volts AC at 60Hz. Some hotels may provide outlet converters for 110 volts. Visitors are advised to check with the hotel beforehand or bring a suitable adapter.

Mobile Phone Rental

Celluar phones can be rented from the Incheon or Gimpo International Airports. A passport and a credit card should be presented upon renting. Payments can be made with cash or a credit card upon returning of the device. Online reservation can also be made at http://english.visitkorea.or.kr/enu/RE/RE_EN_1_2_4_1.jsp

City Tour Bus (Gangnam Area)

Gangnam, with 21 tourist attractions, can be toured by circulating city tour buses.
Tel.: +82-2-3448-5991
Customer Center: 365 Days 10:00-20:00
Website: http://www.gangnamtour.go.kr/eng1/cityres/cityres02.php

Transportation

The public transportation system in Seoul is very well-developed and systematically planned. Almost all commuters use buses, trains, or subways. When paying with a prepaid transportation card or a similar T-Money device, transfers between subways and buses do not charge an extra amount.

T-Money Card

T-money is a prepaid transportation card in Korea that can be used for any public transportation.
• Card Deposit: KRW2,500
• Card Sales and Recharges: convenience stores, ticket vending machines and booths inside subway stations and vendor shops in street kiosks.

*Foreign participants will receive a transportation card with KRW 5,000 charged, a gift from the Seoul Metropolitan Government.

Subway

The Seoul subway system has 9 lines, and the minimum subway fee is KRW 1,050 (for 10km (6.2mi))
• Additional fees may be charged depending on the distance travelled.
• www.seoulmetro.co.kr

Bus

Riding the bus in Seoul is very convenient. You can easily find bus stops on the street.
• Bus Fare: KRW 1,050 ~ KRW 1,150
• One fare with a prepaid card is good for up to 5 transfers in one trip (subway included)
• One must scan their T-Money card before exiting the bus as well, regardless of the need to transfer.
• www.sbus.or.kr

Taxi

Taxis can be fetched anywhere in Seoul. It is recommended passengers show printed maps or destination names in Korean to taxi drivers, since drivers may not understand English. Foreigners may also opt for an international taxi.

• Taxi Fare: from KRW 3,000
• Prices are more expensive from midnight to 4:00a.m.
• Black deluxe taxis are more expensive.
• taxi.or.kr
• www.intltaxi.co.kr

Handy Smartphone Apps

SEOUL ICM

The official mobile app "SEOUL ICM" for the SEOUL ICM 2014 is available. Manage schedules and to-do lists, view maps and do much more on your phone or any other Android of IOS devices.
More info, https://guidebook.com/app/SEOULICM/

i Tour Seoul

Featured contents
• Comprehensive travel information
• Real tourist reviews
More info, www.visitseoul.net/en/

SeoulBus

Provides bus stop information of the Seoul metropolitan region and connected outlying areas (Incheon and Gyeonggi-do)

Subway

Provides Korea's subway information, including timetables, transfer details, area guides and more

이 사례를 통해 하나 더 볼수 있는 것은

- 많은 양의 정보를 일정하게 양식에 맞게 빠른 시간으로 작업하려면 TEX 만한 것이 없다.

이 사례를 통해 하나 더 볼수 있는 것은

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- TEX으로도 충분히 장식이 많이 들어가는 조판도 가능하다.

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- TEX으로도 충분히 장식이 많이 들어가는 조판도 가능하다.
- 표준화의 중요성. 편리함 vs 안정성

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- TEX으로도 충분히 장식이 많이 들어가는 조판도 가능하다.
- 표준화의 중요성. 편리함 vs 안정성

감사합니다.