



TITLE:

# 1 min. talks (Women in Mathematics)

AUTHOR(S):

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RIGHT:

## 1 min. talks

9月7日  
15:10—16:10

1. Ade Irma Suriajaya
2. Yuko Yano
3. Yuanyuan Bao
4. Sakie Suzuki
5. Hideko Hashiguchi
6. Satoko Sugano
7. Rika Ishida
8. Makiko Sasada
9. Shihoko Ishii
10. Nguyen Thi Hoai Linh
11. Yukari Ito
12. Reiko Miyaoka
13. Akari Kameda
14. Sonia Mahmoudi
15. Noe Kawamoto
16. Miyuki Koiso
17. Nanao Kita
18. Reiko Toriumi
19. Tomoko Takemura

9月8日  
15:10—16:10

1. Karin Ikeda
2. Marie Watanabe
3. Motoko Kato
4. Haruka Watanabe
5. Yuka Kotorii
6. Sin Yi TSANG
7. Ayako Kubota
8. Hoshi Tominaga
9. Misato Kudo
10. JuAe Song
11. Hiroko Manaka
12. Futaba Sato
13. Haru Negami
14. Yumiko Ohno
15. Itsuki Nakamura
16. Maki Nakasuji
17. Akira Lee
18. Eiko Kin
19. Aoi Honda

Summer 2011 Summer 2016 Spring 2017  
Nanjing (NUAA) → Nagoya Univ. → JSPS PD → RIKEN iTHEMS SPDR  
Spring 2019  
→ Kyushu Univ. Math. Assist. Prof.  
RIKEN iTHEMS Visit. Sci.

**Number Theory ⊃ Analytic Number Theory**

: the study of numbers (integers) using analytic methods (complex + Fourier analysis)

$\zeta(s) = 2^s \pi^{s-1} \sin\left(\frac{\pi s}{2}\right) \Gamma(1-s)$  ⇔ suffices to study prime numbers

Distribution of prime numbers using zeros of zeta functions  
(and L-functions)

※ Riemann Hypothesis, Prime Number Theorem, Goldbach's Conjecture, Twin Primes, ...

More on: <http://www2.math.kyushu-u.ac.jp/~adeirmasuriajaya/index.html>  
or <https://sites.google.com/site/adeirmasuriajaya/>

2, 3, 5, 7, 11, 13, 17, 19, 23, ...

**Ade Irma Suriajaya / Chacha (Kyushu University)**

## Research Interest: Probability Theory

**Key words:** Markov process, Brownian motion, Diffusion process, Lévy process, penalisation

### Education & Career:

- 2005 PhD Sci., Ochanomizu University
- 2005 -- 2009 Postdoctoral Research Fellow (Ocha. U./Rits. U./RIMS)
- 2009 -- 2012 Assistant Professor (Rits. U./Kyoto U.)
- 2012 -- 2018 Associate Professor (Kyoto Sangyo U.)
- 2018 -- 2022 Professor (Kyoto Sangyo U.)
- 2022 -- present Professor (Graduate School of Engineering Science, Osaka U.)

Yuko YANO (Osaka University)

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I got my Ph.D degree from Murakami Lab at Tokyo Institute of Technology. Before current position, I worked as postdoc in iBMath at the University of Tokyo and project assistant professor in Tohoku Forum for Creativity at Tohoku University.

Research field : Low-dim topology, in particular knot theory.

Interested topics: Heegaard Floer homology, quantum invariant for knots.

Current research: Constructed a 3-manifold invariant using representations of Lie superalgebra  $gl(1, 1)$ .

I have two children and one cat. I spend most of my vacation time with them.

Yuanyuan Bao (the University of Tokyo)

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# Life & Research interest

*sakietotera.com*

- Nagoya → Kyoto → Fukuoka → Kyoto → Tokyo
- Quantum topology (knots and 3-manifolds)
- Students (countably many) [sakietotera-lab.com](http://sakietotera-lab.com)
- Teracoya [sakietoteracoya.com](http://sakietoteracoya.com)
- KIOCOT [kiocot.tumblr.com](http://kiocot.tumblr.com)
- 8 months old baby (on parental leave)



Sakie SUZUKI  Tokyo Tech

# 4

## Harmonic map, Integrable systems, Uniton

- Factorization of harmonic maps  $\phi: S^2 \rightarrow Gr_2(\mathbb{C}^4)$  into unitons

## Semi-symmetric space, Pseudo-symmetric\* space

- Construction of new example of pseudo-symmetric space
- \* : some weakly condition of semi-symmetric and of locally-symmetric

## Mathematical education

- Study of students who do not major in mathematics but do in engineering, computer science, and so on
- Education required during elementary school, junior high school and senior high school

15% of students, 13% of professors are female  
in Chiba Institute of Technology

Hideko HASHIGUCHI (Chiba Institute of Technology)

# 5

**Position:** Professor

**Degree:** Doctor of Science, in Gakushuin University

**Specialized Field:**

Real Analysis, Partial Differential Equations

**Interest:**

- Schrödinger type operators
- Generalized fractional integral operators

Satoko SUGANO (Kobe City College of Technology)

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Mathematics fields shown in the program.

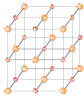
Prime Number	Topology
Mathematics in music	tessellation

I create maths TV programmes.

Rika Ishida (NHK EDUCATIONAL)

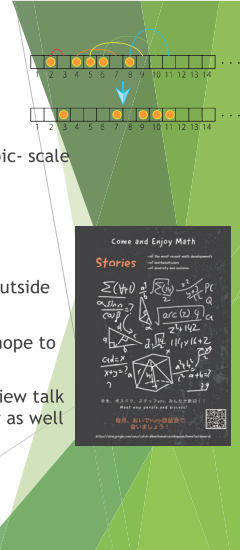
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## Self-introduction



- ◆ Research interest : How can we connect microscopic- and macroscopic- scale phenomena mathematically? How different?
- ◆ Research keywords : probability theory, interacting particle systems, hydrodynamic limits, integrable systems, group cohomology, Hodge decomposition
- ◆ I like discussions with people from different fields, both inside and outside mathematics. It gives me a lot of inspiration.
- ◆ I also really like to share the fun of mathematics with others, and I hope to do this in particular with more girls and women.
- ◆ I co-organize a monthly math colloquium, where after a broad overview talk for a general mathematical audience, the speaker's personal journey as well as DEI related discussion follows.

Makiko Sasada (University of Tokyo)



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### MY PROJECT:

Study of singularities by means of the arc/jet schemes

- ① Describe birational invariants of singularities in terms of the arc/jet schemes without any conditions of characteristic of the base field.
- ② Describe the behaviors of the invariants in terms of the arc/jet schemes without any conditions of characteristic of the base field.

The University of Tokyo, Project professor, Shihoko Ishii

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## Outline of Research

- **Mathematical modeling in biology, ecology**
  - ☑ Deterministic/Stochastic Lotka-Volterra predator-prey model
  - ☑ Stochastic forest model
  - ☑ Animal swarming model
- **Develop and utilize mathematical algorithms/tools to solve theoretical and practical problems**
  - ☑ Communication protocols over multi-agent systems
  - ☑ Numerical study on the quantum Rabi model
  - ☑ Mineralization process in porous media using random walk with absorption
  - ☑ Accelerating material discovery using machine learning approach

Nguyen Thi Hoai Linh  
Institute of Mathematics for Industry, Kyushu University, Japan

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### RESEARCH INTEREST

Algebraic Geometry > **Singularity**

> Resolution of Singularity and the McKay correspondence

### SHORT BIOGRAPHY

PhD at U. Tokyo → JSPS research fellow at RMS, Kyoto University,

→ Assistant Professor at Tokyo Metropolitan University (**2 children!** 😊😊),

→ Lecturer and Associate Professor at Nagoya University → Professor at Kavli IPMU from 2017.

### MEMBERSHIP

• Mathematical Society of Japan • **Science Council of Japan** from 2020

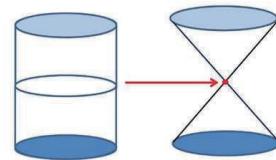
• WISE of AASSA from 2022 • EC of **AOWM** (Asia-Oceania Women in Mathematics) from 2022

### OTHER ACTIVITIES

• **Women's lunch** at Nagoya and IPMU from 2003

• Exhibitions "**Mathematics Museum**" and writing **Books**

• Japanese subtitles on "**Secrets of the surface**" in 2020



Yukari Ito (Kavli IPMU, The University of Tokyo)

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(Women in Math. 2022)


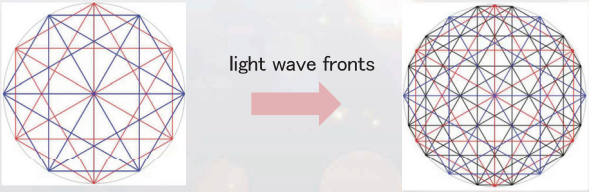
I am a retired mathematician majoring in Geometry.

I have three children and one granddaughter.  
 During my ten years of raising children, I have had hard days.

**Now it's much better in many aspects!**

Everyone enjoys her/his life as she/he likes, spends a life with/without family,  
 and women can do anything they like.

I'm proud of my work appeared in Annals of Math. (2013, 2016).  
 This is the solution to Yau's 34<sup>th</sup> problem (1992) on the classification of certain 12-dimensional  
 figure in the 13-dimensional sphere, related to the exceptional Lie group  $G_2$  (Fig. by S. Fujimori).

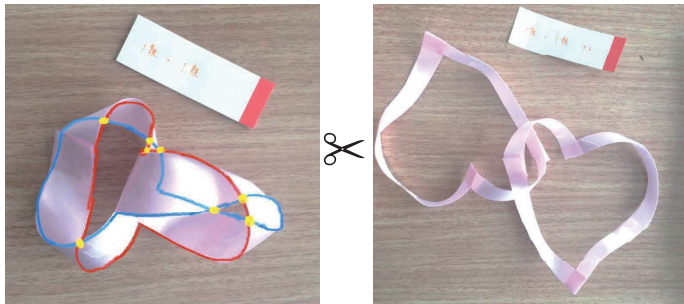
light wave fronts


Reiko MIYAOKA (Tohoku University, Professor Emerita)

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I am interested in Geometry

My study : ***“One-stroke drawing and the Moebius strip”***

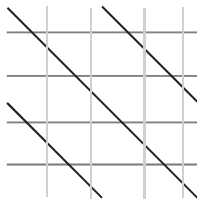


 → Knot theory

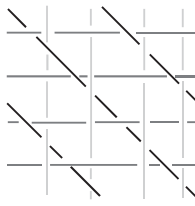
Akari KAMEDA (Nara Women's University)



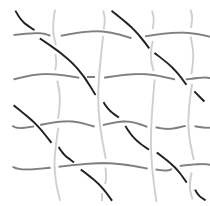
## Definition, Construction & Classification of Weaves



Quadrivalent graph  $\Gamma$ : set of colored straight lines in  $\mathbb{E}^2$ .



Set of pairwise crossing sequences  $\Sigma$ : over or under information to each vertex of  $\Gamma$

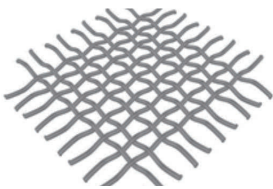


**Untwisted weave** in  $\mathbb{X}^3 = \mathbb{E}^2 \times I$ , with  $I = [-1, 1]$ .

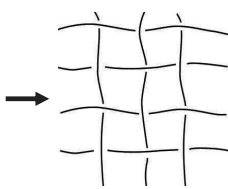
Keywords: weaving, knot theory, tilings of the plane, topological invariants

Self-introduction

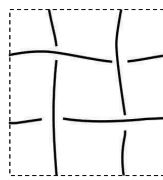
- DC3 until 9/26
- Prof. M. Kotani
- JSPS DC2
- From France
- 3 years in Japan



Doubly Periodic Weave  $W$



Infinite Diagram  $D_{W_0}$



Weaving Motif  $D_W$

link diagram on a torus

→ knot theory

Sonia MAHMOUDI (Tohoku University)

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## NOE KAWAMOTO <sup>1</sup>

**1** Supervizer : Professor Akira Sakai .

**2** Research interest :

- ▶ To study the critical phenomena for the various statistical mechanical models.
  - Self-avoiding walk,
  - Lattice tree,
  - $\phi_4$  model, etc..
- ▶ To use the lace expansion, which is one of the methods to investigate critical phenomena.

**3** Current Paper :

- ▶ N.Kawamoto, A.Sakai. Spread-out limit of the critical points for the lattice trees and lattice animals in dimensions  $d > 8$ . arXiv:2205.09451

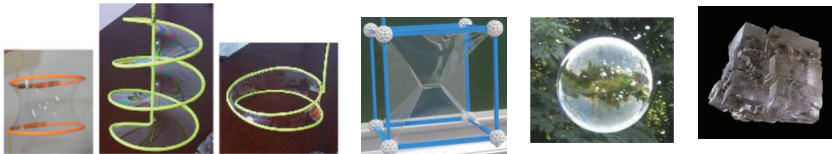
<sup>1</sup>Noe KAWAMOTO, 2nd year Ph.D. student  
(Graduate School of Mathematics, Hokkaido university)

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### Research field: Geometric variational problems

Research subjects: (Stability of) Mathematical models of

- Soap films (smooth minimal surfaces)
- Soap bubbles (smooth surfaces with constant mean curvature)
- Crystals (surfaces with constant anisotropic mean curvature which have singular points !), etc.



Current Interest: Construction of new methods to study variational problems for piecewise-smooth surfaces

Current Difficulty: balancing work and care of my husband.  
My husband is a physically handicapped person!

Miyuki Koiso (Kyushu University)

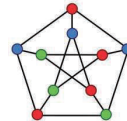
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### Research Area

Discrete mathematics/Combinatorics, particularly,  
**Graph theory, Algorithms, and Combinatorial optimization**

### Research Topics

- **Canonical decomposition theory for graphs**
- Recently I am also interested in the intersection of graph theory and physics (e.g., application of graph theory to the Ising spin glass model)



### What's fascinating about studying graphs

Very sophisticated structure sometimes arises in such a simple concept

### What made me choose this area of study

Essence of the theory of computation resides in these areas

Thank you for the opportunity!

Nanao Kita (Tohoku University)

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**Reiko Toriumi** (Mathematical Physicist)

Okinawa Institute of Science and Technology

Main research interest: Random Tensors as an approach to Quantum Gravity

Quantum Gravity = Quantum Geometry = Sum over all possible geometries and topologies via Path Integral Formulation

Construct a combinatorially nonlocal 0-dimensional field theories of size  $N$  random tensors with  $d$ -indices  $T : \mathbb{Z}_N^d \rightarrow \mathbb{C}$  ( $T = T_{a_1 \dots a_d}$ ,  $a_i \in \{1, \dots, N\}$ ) and the probability measure is given by

$$d\nu(T, \bar{T}) = d\mu_{\mathbf{P}}(T, \bar{T}) e^{-S_N[T, \bar{T}]},$$

where  $d\mu_{\mathbf{P}}$  is Gaussian with covariance  $\mathbf{P}$ ,  $\int d\mu_{\mathbf{P}}(T, \bar{T}) T_{a_1 \dots a_d} \bar{T}_{b_1 \dots b_d} = \mathbf{P}_{a_1 \dots a_d, b_1 \dots b_d}$ .

-  $(d + 1)$ -edge-colored graphs (also, called graph encoding manifolds (GEM) ) are dual to simplicial triangulations of piecewise linear (PL)  $d$ -dimensional pseudo-manifolds.

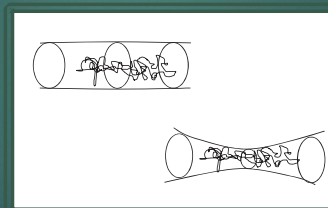
- In the large  $N$  limit, a class of graphs, *melons* (topologically subclass of spheres) dominate.

- Random Geometry
- Topology
- Combinatorics and Graph Theory
- Eigenvalues of tensors (mathematics, computer science (graphics), artificial intelligence, etc)
- Quantum Field Theory and Renormalisation
- Conformal Field Theory
- Holography (via melons)
- etc.

"Women at the Intersection of Mathematics and Theoretical Physics" 20-24 March 2023 at OIST

<https://groups.oist.jp/WIMTP>

Interest : Probability Theory  
 Stochastic Process, Limit Theorem,  
 skew product, Dirichlet Form,  
 Diffusion process in a Tube



Tomoko TAKEMURA (Nara Women University)

- I am the 1st year MC student at Kyushu University.
- My supervisor is professor Masanobu Kaneko

### Research and interests:

- Multiple Zeta Value (with M. Sakata, in preparation)  
“On products of multiple zeta values with full height”
- Hurwitz Zeta Function
- Seal (seadog) : for example, tooth shape, changes in body shape...



Karin Ikeda (Graduate Program of Mathematics for Innovation, Kyushu University)

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#### Research fields

Metrology, Geometry

#### Research theme

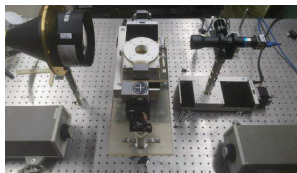
3D measurement of freeform shapes

#### Measurement methods

X-ray CT



Optical measurement



Marie Watanabe

National Institute of Advanced Industrial Science and Technology

Science outreach

Tsukuba Science Network

(<http://tsukubasciencenetwork.web.fc2.com/>)

2

# 1min Speech (Women in Math 2022)

Area : Geometric Group Theory

Key Words : Group actions on non-positively curved spaces, Richard Thompson's groups, Artin-Tits groups, ...



Motoko Kato (University of the Ryukyus)

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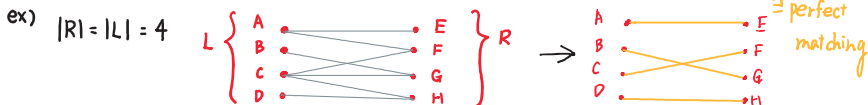
## About Me

- Name: Haruka Watanabe
- Interest: Optimization  
 Probability(Branching process)  
 Combinatorics(Knot Theory)
- Hall's marriage theorem:

(Summary)

$|R|=|L|$  (R and L are sets of vertices)

$\exists$  perfect matching  $\Leftrightarrow |\{i \in R \mid i \text{ and at least one member in } X \text{ are friends}\}| \geq |X| \quad \forall X \subset L$



Haruka Watanabe (University of Cambridge)

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Name: Yuka Kotorii

Affiliation: Hiroshima university / RIKEN

Position: associate professor / visiting scientist

Research topic:

low dimensional topology, knot theory

- knot and link invariant

Other interest: interdisciplinary research

Yuka Kotorii (Hiroshima University)

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**Research Area:** Group Theory, Algebraic Number Theory

**Keywords:**

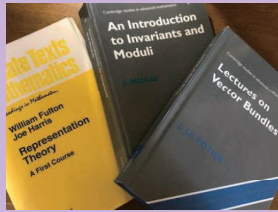
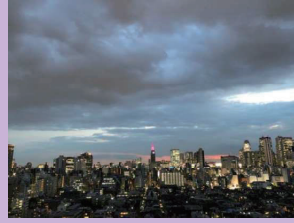
- Galois module structure of rings of integers
- Hopf-Galois structures
- Regular subgroups
- Holomorph
- Multiple holomorph
- Skew braces
- Yang-Baxter equation

Cindy (Sin Yi) TSANG (Ochanomizu University)

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Field of research: algebraic geometry.

- The invariant Hilbert scheme
- Resolution of singularities
- Cox realization



- Representation of Lie algebras
- Invariant theory
- The Hilbert scheme

Ayako KUBOTA Waseda University

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**1975 Freshman at Kyoto University**

(Dept. of Mathematics) / (Female) / (Faculty of Science)

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**After a few months.....**

"Because I know the mathematics is interesting (owing to "Infinity and Continuity" by Hiraku Toyama(遠山啓)),

And that I understand the feeling of those who have difficulties in mathematics, I am rather communicator-type !"

**Graduated in Mathematical Science → Teacher in secondary education → Translator of mathematical books for the public.**

**I translated for example.....** "Music of Primes" by Marcus du Sautoy, "Group Theory in the Bedroom" by Brian Hayes,

"Letters to a Young Mathematician" by Ian Stewart, "Joy of X" by Steven Strogatz,

"Mathematicians" by Mariana Cook, "99 Variations on a Proof" by Philip Ording

"Symmetry" by Hermann Weyl .....

**I have been, and will be interested in .....**

What the mathematics is.

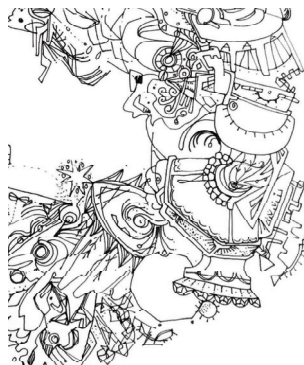
What the mathematicians see in the mathematics.

The difference between the mathematics and the physics, the logics, the philosophy.

**Hoshi TOMINAGA (福永星) Translator**

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4th year student  
Knot theory  
I love drawing



Misato Kudo (Tsuda University)

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- JuAe Song (songjuae@tmu.ac.jp)
- A visiting researcher of TMU in Japan
- Tropical geometry = an algebraic geometry /  $\mathbb{T}$   
 $\mathbb{T} := (\mathbb{R} \cup \{-\infty\}, \max, +)$
- Tropical curves correspond to algebraic curves.
- In my graduate school, my main object to study was automorphism groups of tropical curves.
- Recently, I focus on rational function semifields of tropical curves.

JuAe Song (Tokyo Metropolitan University) 10



**My History:**

- (1) Tsuda University : Master of Sc., Teacher's license of math.  
 (2) Keio University: The doctoral course of mathematical science,  
*The interface of the Ising model and Brownian sheet (JSP)*  
 (3) Tokyo Institute of Technology: Research student;  
*Almost stability of iterative schemes involving a uniformly hemi-contractive setvalued mapping in a Banach space (YMJ)*  
 (4) Yokohama National University : Lecturer, given Ph.D,  
*Convergence theorems for a maximal monotone operator and a  $V$ -strongly nonexpansive mapping in a Banach space (AAA) ID 189814*  
 (5) Nihon University :Associate Professor,  
*The split feasibility problem with some projection methods in Banach spaces (AAA) ID 2913087*  
**Key words:** *Fixed point theorems, Iterative methods, Nonlinear operators, Banach spaces, Bregman distance, Approximation theory.*

\* Hiroko MANAKA ( Nihon University )

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**My Interests:****Analysis and Mathematical Physics**

- Operator Theory
- Integrable Systems

**Futaba SATO**

The University of Tokyo

Faculty of Mathematics and Science  
 (undergraduate student)

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Position: Undergraduate (Junior)  
 Nationality: Japan

Subject of Interest

I'm majoring in *Algebra*, especially *Number theory*.  
 And I have interest in *p-adic number field*, *Ideal class group*, *Zeta function*.  
 In the future, I'd like to study *Iwasawa theory*.

Recent Considerations

I am hypothesizing and considering the behavior that appears in the *Partition function*  $p(n, 3)$  which is the number of patterns of divides with sum factors less than or equal to 3.

Itsuki NAKAMURA (Tsuda University)
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Research Interests

Analytic number theory  
Representation theory

Key words

- Zeta functions
- Iwahori-Whittaker function
- Schur multiple zeta function

$$\zeta(s) = \sum_{m=1}^{\infty} \frac{1}{m^s}$$

Whittaker function for the principal series representation of the p-adic group  
 For the principal series representation invariant to the action of the **Iwahori subgroups** on the p-adic group, there is a basis defined by Casselman as the dual of the intertwining operator. It is an open problem since 1980 that I am interested in giving a concrete description of transformation matrices between **Casselman bases** and standard bases.

Analysis of behavior of Schur multiple zeta functions  
**Schur multiple zeta function** is a combinatorial extension of the multiple zeta function, which is the subject of research in analytic number theory, and has a similar structure to the Schur function, which is important in representation theory. I am interested in new relations obtained by treating multiple theories in a complex manner.

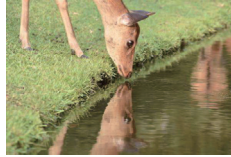
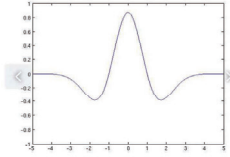
$$\zeta_{\lambda}(s) = \sum_{(m_{ij}) \in \text{SSYT}_{\lambda}} \prod_{(i,j) \in D_{\lambda}} \frac{1}{m_{ij}^{s_{ij}}}$$

$\lambda$  : partition  
 $D_{\lambda}$  : Young diagram of shape  $\lambda$   
 $s=(s_{ij})$  where  $(i,j) \in D_{\lambda}$   
 $\text{SSYT}_{\lambda}$  : set of semi-standard Young tableaux

Maki Nakasuji (Sophia University/Tohoku University)

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- Wavelet Analysis
- Osaka
- Japanese, Chinese, English
- Photo



Akira Lee (Nara Women's University)

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**Communicating science for the advancement of science**

**started with science events**

**moved to science in the news**

**then meeting politicians**

**Motoko Kakubayashi**  
Kavli Institute for the Physics and Mathematics of the Universe, The University of Tokyo

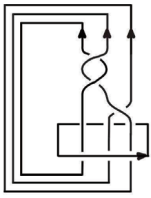
**visiting big science experiments**

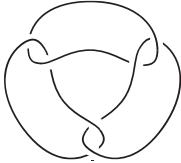
**publishing pictures**

**and writing for researchers**

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**Key: Braids**



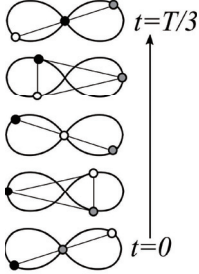


Hyperbolic  
3-manifolds

- Dynamical systems
- Topology



pseudo-Anosov



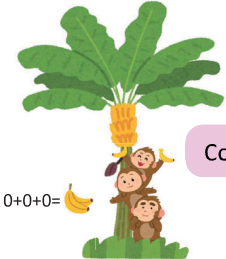
Planar 3-Body problem

Eiko Kin (Osaka University)

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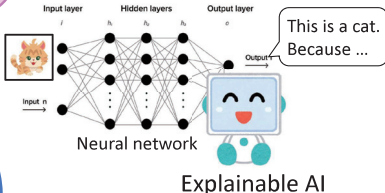
**Nonadditive measure**  
for  $A \cap B \neq \emptyset$   
 $\mu(A \cup B) \gtrless \mu(A) + \mu(B)$

Properties related to non-additivity



0+0=0

**Aggregation function**




Neural network

Explainable AI


This is a cat. Because ...

**Cooperative Game Theory**  
Allocation problem


Into cooking and dancing now.




My family



Working in Tokyo




Studying in Kyoto



**Nonlinear integral**  
Convergence theorem

I'm also interested in applications and social implementation!



**Aoi HONDA** (Kyushu Institute of Technology)

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