

## Remark

- The order of authors is written according to your input order. The first author is not necessarily the speaker. If the talk have two or more authors, then the speaker is underlined.
- The mark  $\flat$  means the presentation by using the whiteboard/blackboard. If you talk by using your PC/tablet, no mark is written.
- The mark  $\star$  means emeritus professor.
- The number on the right side of the title implies the time of talk (minutes). There are some talks whose limited time is shortened due to various reasons. Your kind understanding is appreciated.

## Contents

Foundation of Mathematics and History of Mathematics . . . . .	2
Algebra . . . . .	4
Geometry . . . . .	9
Complex Analysis . . . . .	12
Functional Equations . . . . .	14
Real Analysis . . . . .	20
Functional Analysis . . . . .	23
Statistics and Probability . . . . .	25
Applied Mathematics . . . . .	28
Topology . . . . .	32
Infinite Analysis . . . . .	34

# Foundation of Mathematics and History of Mathematics

March 16th (Mon)

## 9:30–12:00

- 01-01-0017  
1 Teruyuki Yorioka (Shizuoka Univ.) YPFA implies MRP ..... 15  
Tadatoshi Miyamoto (Nanzan Univ.)
- 01-01-0011  
2 Daisuke Ikegami Generic absoluteness in ZF ..... 15  
(Shibaura Inst. of Tech.)
- 01-01-0005  
3 Toshimichi Usuba (Waseda Univ.) On generically extendible cardinals ..... 15
- 01-01-0010  
4 Diego A. Mejía (Shizuoka Univ.) Lebesgue measure zero modulo ideals ..... 15
- 01-01-0004  
5 Kenetsu Fujita (Gunma Univ.) George Boolos’ “The Hardest Logic Puzzle Ever” revisited ..... 15
- 01-01-0003  
6 Takahiro Seki (Niigata Univ.) A Gentzen-style formulation for involutive substructural logics with  
contraposition ..... 15
- 01-01-0006  
7 Yoshihito Tanaka A representation of modal algebras preserving countably many infinitary  
(Kyushu Sangyo Univ.) meets and joins ..... 15
- 01-01-0007  
8 Yuya Okawa (Chiba Univ.) Generalizations of Bennet’s result on partially conservative sentences  
Taishi Kurahashi ..... 15  
(Nat. Inst. of Tech., Kisarazu Coll.)

## 14:15–15:00

- 01-01-0001  
9 Shigeru Masuda Study of the Eulerian Integrals by Legendre ..... 15  
(Res. Workshop of Classical Fluid Dynamics)
- 01-01-0002  
10 Shigeru Masuda The complete functions by Legendre ..... 15  
(Res. Workshop of Classical Fluid Dynamics)
- 01-01-0015  
11 Hideyuki Majima (Ochanomizu Univ.) Towards the year 2022, the 314th memorial year of SEKI Takakazu  
..... 15

## 15:15–16:15 Talk Invited by Section on Foundation and History of Mathematics

- 01-02-0002  
Masahito Takase Shaping the fountains in Modern Western Mathematics

March 17th (Tue)

## 9:00–10:30

- 01-01-0014  
12 Kohtaro Tadaki (Chubu Univ.) A refinement of quantum information theory by algorithmic randomness  
III ..... 15
- 01-01-0012  
13 Kenshi Miyabe (Meiji Univ.) The speed of convergence of induction ..... 15  
Toru Takisaka  
(Nat. Inst. of Information)
- 01-01-0009  
14 Hisashi Aratake (Kyoto Univ.) Classifying toposes for existentially closed models and finite-generic  
models ..... 15
- 01-01-0013  
15 Kazuyuki Tanaka (Tohoku Univ.) On eigen-distributions for Boolean trees in the ID case ..... 15

## 3 Foundation of Mathematics and History of Mathematics

01-01-0016

- 16 Keita Yokoyama (JAIST) Kripke models and separations of logical principles ..... 15  
 Makoto Fujiwara (Meiji Univ.)  
 Hajime Ishihara (JAIST)  
 Takako Nemoto (JAIST)  
 Nobu-Yuki Suzuki (Shizuoka Univ.)

01-01-0008

- 17 Toshiyasu Arai (Univ. of Tokyo) Some contributions to proof theory ..... 15

**10:45–11:45 Talk Invited by Section on Foundation and History of Mathematics**

01-02-0001

- Nobu-Yuki Suzuki (Shizuoka Univ.) Disjunction and existence properties in intermediate predicate logics

**11:45–12:00 Research Section Assembly****12:00–12:15 Mathematics History Team Meeting**

# Algebra

March 16th (Mon)

## 10:00–12:00

02-01-0010

- 1 Hiroyuki Nakasora (Kobe Gakuin Univ.) The extended doubling of the Golay code and the Moonshine code ..... 10

02-01-0002

- 2 Bernhard Mühlherr (Univ. Giessen) Koji Nuida (Univ. of Tokyo) Locally finite continuations and Coxeter groups of infinite ranks ..... 10

02-01-0069

- 3 Naoki Chigira (Kumamoto Univ.) Solutions of a certain equation on a group and group structure ..... 10

02-01-0035

- 4 Fumihito Oda (Kindai Univ.) Yugen Takegahara (Muroran Inst. of Tech.) Crossed Burnside rings and Mackey 2-functors ..... 10

02-01-0045

- 5 Akihiko Hida (Saitama Univ.) On the relation of the product of character degrees and the product of conjugacy class lengths of a finite group ..... 10

02-01-0046

- 6 Akihiko Hida (Saitama Univ.) Lower defect groups and vertices of simple modules ..... 10

02-01-0005

- 7 Shigeo Koshitani (Chiba Univ./Chiba Univ.\*)<sup>b</sup> Ipek Tuvay (Mimar Sinan Fine Arts Univ.) Brauer indecomposability of Scott modules for the quadratic group  $Qd(p)$  ..... 10

02-01-0006

- 8 Shigeo Koshitani (Chiba Univ./Chiba Univ.\*)<sup>b</sup> Caroline Lassueur (TU Kaiserslautern) Splendid Morita equivalences for principal blocks with dihedral defect groups ..... 10

02-01-0007

- 9 Shigeo Koshitani (Chiba Univ./Chiba Univ.\*)<sup>b</sup> Caroline Lassueur (TU Kaiserslautern) Splendid Morita equivalences for principal blocks with generalised quaternion defect groups ..... 10

02-01-0067

- 10 Mawo Ito (Kyoto Univ.) Shuhei Kamioka (Kyoto Univ.) A product formula for plane partitions derived from a biorthogonal polynomial ..... 10

## 14:15–15:15 Talk Invited by Algebra Section

02-02-0002

- Kenichiro Tanabe (Hokkaido Univ.)<sup>b</sup> Representations of some fixed point subalgebra of the vertex algebra associated to a non-degenerate even lattice

## 15:30–16:50

02-01-0011

- 11 Mamoru Ueda (Kyoto Univ.) Affine super Yangian ..... 10

02-01-0043

- 12 Satoru Urano (Univ. of Tsukuba) Modular moonshine ..... 10

02-01-0055

- 13 Scott Carnahan (Univ. of Tsukuba) Monstrous moonshine over the integers ..... 10

02-01-0054

- 14 Kazuya Kawasetsu (Kumamoto Univ.) David Ridout (Univ. of Melbourne) Relaxed highest-weight modules over affine vertex operator algebras ..... 10

02-01-0008

- 15 Hiroki Shimakura (Tohoku Univ.) On automorphism groups of the holomorphic VOAs associated with Niemeier lattices and the  $-1$ -isometries ..... 10

02-01-0056

- 16 Ching Hung Lam (Academia Sinica) Hiroshi Yamauchi (Tokyo Woman's Christian Univ.) On a  $c=33$  extremal VOA ..... 10

02-01-0024	17 Sota Asai (Kyoto Univ.)	Wide intervals in lattices of torsion classes . . . . .	10
------------	----------------------------	---	----

## March 17th (Tue)

**10:00–11:45**

02-01-0019	18 Masahisa Sato (Aichi Univ.)	Some examples of rings and modules relating to Ware's problem . . . . .	10
02-01-0026	19 Yoshiharu Shibata (Yamaguchi Univ.) Isao Kikumasa (Yamaguchi Univ.) Yosuke Kuratomi (Yamaguchi Univ.)	On dual square full modules . . . . .	10
02-01-0016	20 Ayako Itaba (Tokyo Univ. of Sci.)	On finite generations over centers of non-commutative projective schemes associated to 3-dimensional quadratic AS-regular algebras . . . . .	10
02-01-0031	21 Masaki Matsuno (Shizuoka Univ.)	The classification of 3-dimensional quadratic AS-regular algebras whose point schemes are elliptic curves . . . . .	10
02-01-0030	22 Ji-Wei He (Hangzhou Normal Univ.) Haigang Hu (Shizuoka Univ.)	Hopf dense Galois extensions over a ring . . . . .	10
02-01-0061	23 Hiroki Matsui (Univ. of Tokyo)	Construction of spectra of triangulated categories and their applications to commutative algebra . . . . .	10
02-01-0070	24 Ayana Hirano (Kitami Inst. of Tech.) Kazunori Matsuda (Kitami Inst. of Tech.)	Matching numbers and dimension of edge ideals . . . . .	10
02-01-0023	25 Mitsuhiro Miyazaki (Kyoto Univ. of Edu.) Janet Page (Univ. of Michigan)	On the traces of the canonical modules of the Ehrhart rings of order and chain polytopes . . . . .	10
02-01-0032	26 Akihiro Higashitani (Osaka Univ.) Hidefumi Ohsugi (Kwansei Gakuin Univ.)	Toric ideals of generalized permutohedra . . . . .	10
<b>13:00–14:15</b>			
02-01-0042	27 Hidefumi Ohsugi (Kwansei Gakuin Univ.) Akiyoshi Tsuchiya (Univ. of Tokyo)	Nef-partitions arising from unimodular configurations . . . . .	10
02-01-0039	28 Akiyoshi Tsuchiya (Univ. of Tokyo) Takayuki Hibi (Osaka Univ.)	Initial ideals and their depth . . . . .	10
02-01-0040	29 Chris McDaniel (Endicott Coll.)	Equivariant coinvariant rings of finite groups . . . . .	10
02-01-0041	30 Junzo Watanabe (Tokai Univ.)* Chris McDaniel (Endicott Coll.)	A new definition of the principal radical system and an application to Specht ideals of type $(n - k, k)$ . . . . .	10
02-01-0048	31 Kohsuke Shibata (Okayama Univ.) Kohji Yanagawa (Kansai Univ.)	Hilbert series of Cohen–Macaulay Specht ideals . . . . .	10
02-01-0049	32 Shreedevi Masuti (Chennai Math. Inst.) Kazuho Ozeki (Yamaguchi Univ.) Maria Evelina Rossi (Genova Univ.) Hoang Le Truong (Saarlandes Univ.)	On the structure of the Sally module and the second normal Hilbert coefficient . . . . .	10

## March 18th (Wed)

**9:20–12:00**

02-01-0028

33 Tomohiro Iwami (Kyushu Inst. of Tech.)<sup>b</sup> Semistable extremal neighborhoods rigged by framed-form fans of cusptype singularities . . . . . 10

02-01-0029

34 Koji Nuida (Univ. of Tokyo) An elementary linear-algebraic proof for group law on elliptic curves . . . . . 10

02-01-0051

35 Makoto Sakurai (Kaichi Gakuen) Extension and applications of chiral algebra theory . . . . . 10

02-01-0017

36 Yoshifumi Tsuchimoto (Kochi Univ.) On curves on the non-commutative complex Kähler plane . . . . . 10

02-01-0004

37 Tetsuya Ando (Chiba Univ.) Theory of PSD cones on semialgebraic varieties . . . . . 10

02-01-0066

38 Norihiko Minami (Nagoya Inst. of Tech.) On the applicability of the sufficient criterion for a stronger hierarchy of higher uniruledness = lower unirationality via Bott tower . . . . . 10

02-01-0014

39 Yoshifumi Kato (Meijo Univ.) Curvature matrix of the universal bundle of the Grassmann variety . . . . . 10

02-01-0018

40 Yoshifumi Kato (Meijo Univ.) An observation on Schubert polynomials . . . . . 10

02-01-0015

41 Yuki Matsubara (Kobe Univ.) Tamely ramified geometric Langlands correspondence . . . . . 10

02-01-0020

42 Takeito Shirane (Tokushima Univ.) Torsion divisors of plane curves and Zariski pairs . . . . . 10

Enrique Artal Bartolo (Univ. Zaragoza)

Shinzo Bannai

(Ibaraki Nat. Coll. of Tech.)

Hiro-o Tokunaga (Tokyo Metro. Univ.)

02-01-0047

43 Kohei Sato (Oyama Nat. Coll. of Tech.) On Ashikaga's continued fractions and crepant resolutions for 3-dimensional Abelian quotient singularities . . . . . 10

Yusuke Sato (Univ. of Tokyo)

02-01-0037

44 Yuto Yamamoto (IBS-CGP) Periods of tropical Calabi–Yau hypersurfaces . . . . . 10

02-01-0065

45 Takahiro Nagaoka (Kyoto Univ.) The universal covers of hypertoric varieties and Bogomolov's decomposition . . . . . 10

02-01-0027

46 Hiroto Akaike (Osaka Univ.)<sup>b</sup> Slope inequalities for irregular cyclic covering fibration . . . . . 10**14:15–14:30 Presentation Ceremony for the 2020 MSJ Algebra Prize****14:40–15:40 Award Lecture for the 2020 MSJ Algebra Prize**

02-02-0001

Ryo Takahashi (Nagoya Univ.) Generation in module categories and derived categories of commutative rings

**15:50–16:50 Award Lecture for the 2020 MSJ Algebra Prize**

02-02-0004

Takuzo Okada (Saga Univ.) Birational Mori fiber structures of Fano varieties and its application to rationality problems

## March 19th (Thu)

**9:20–12:00**

02-01-0036

47 Fumitsuna Maruyama Recent progress on Euler–Fermat type theorem on matrix ring . . . . . 10  
Masao Toyoizumi (Toyo Univ.)  
Yozo Deguchi

<a href="#">02-01-0044</a>	48 <a href="#">Kiyoto Yoshino</a> (Tohoku Univ.) <a href="#">Qianqian Yang</a> (Univ. of Sci. Tech. China)	Non 2-integrable lattices of rank 12 . . . . .	10
<a href="#">02-01-0013</a>	49 <a href="#">Akinari Hoshi</a> (Niigata Univ.) <a href="#">Kazuki Kanai</a> (Niigata Univ.) <a href="#">Aiichi Yamasaki</a> (Kyoto Univ.)	Norm one tori and Hasse norm principle . . . . .	10
<a href="#">02-01-0022</a>	50 <a href="#">Akinari Hoshi</a> (Niigata Univ.) <a href="#">Kazuki Kanai</a> (Niigata Univ.) <a href="#">Aiichi Yamasaki</a> (Kyoto Univ.)	Norm one tori and Hasse norm principle, II . . . . .	10
<a href="#">02-01-0058</a>	51 <a href="#">Yoshiaki Okumura</a> (Tokyo Tech)	Non-existence of Drinfeld modules with constrained torsions . . . . .	10
<a href="#">02-01-0033</a>	52 <a href="#">Iwao Kimura</a> (Univ. of Toyama) <a href="#">Daiki Aoyama</a> (Univ. of Toyama)	On an estimate of the relative class number of cyclotomic function field of prime conductor . . . . .	10
<a href="#">02-01-0025</a>	53 <a href="#">Mikihito Hirabayashi</a> (Kanazawa Inst. of Tech.)	A generalization of Jakubec's formula related to the multiplication theorem for Bernoulli polynomials . . . . .	10
<a href="#">02-01-0062</a>	54 <a href="#">Yuki Kato</a> (Ube Nat. Coll. of Tech.)	Homotopy invariant $K$ -theory of perfectoidification of regular local rings . . . . .	10
<a href="#">02-01-0009</a>	55 <a href="#">Kazuto Ota</a> (Keio Univ.)	Big Heegner points and generalized Heegner cycles . . . . .	10
<a href="#">02-01-0063</a>	56 <a href="#">Yuichi Sakai</a> (Kyushu Univ.) <a href="#">Kiyokazu Nagatomo</a> (Osaka Univ.)	Characterization of minimal models by modular linear differential equations of order 4 and their modules . . . . .	10
<a href="#">02-01-0034</a>	57 <a href="#">Wataru Takeda</a> (Nagoya Univ.)	Factorial functions represented as norm forms . . . . .	10
<a href="#">02-01-0057</a>	58 <a href="#">Kazunari Sugiyama</a> (Chiba Inst. of Tech.)	Prehomogeneous zeta functions and the Katok–Sarnak correspondence . . . . .	10
<a href="#">02-01-0052</a>	59 <a href="#">Ryojun Ito</a> (Chiba Univ.)	On special values at integers of $L$ -functions of Jacobi theta products of weight 3 . . . . .	10
<a href="#">02-01-0021</a>	60 <a href="#">Masatoshi Suzuki</a> (Tokyo Tech)	On a family of integral operators arising from zeta functions. II. . . . .	10
<b>14:15–15:15 Talk Invited by Algebra Section</b>			
<a href="#">02-02-0003</a>	<a href="#">Kenichi Namikawa</a> (Kyushu Univ.)	Explicit constructions of automorphic forms and its applications to Iwasawa theory	
<b>15:25–16:50</b>			
<a href="#">02-01-0064</a>	61 <a href="#">Masahiro Mine</a> (Tokyo Tech)	Moments of $L$ -functions associated with cubic fields . . . . .	10
<a href="#">02-01-0059</a>	62 <a href="#">Ade Irma Suriajaya</a> (Kyushu Univ./RIKEN) <a href="#">Shōta Inoue</a> (Nagoya Univ.) <a href="#">Sumaia Saad Eddin</a> (JKU Linz)	An upper bound for Stieltjes constants of $L$ -functions in the extended Selberg class . . . . .	10
<a href="#">02-01-0060</a>	63 <a href="#">Shota Inoue</a> (Nagoya Univ.)	On the value distribution of the Riemann zeta-function on the critical line . . . . .	10
<a href="#">02-01-0003</a>	64 <a href="#">Saburo Saitoh</a> (Gunma Univ.*/Inst. of Reproducing Kernels) <a href="#">Tsutomu Matsuura</a> (Gunma Univ.) <a href="#">Hiroshi Okumura</a>	Values of the Riemann zeta function at positive integers by means of the division by zero calculus . . . . .	10

<a href="#">02-01-0038</a>			
65	Hiroshi Ogawara (Kumamoto Univ.)	On algebraic independence of solutions for systems of algebraic Mahler functional equations .....	10
<a href="#">02-01-0068</a>			
66	Debika Banerjee (IISER)	A divisor problem on square free integers .....	10
	<u>Makoto Minamide</u> (Yamaguchi Univ.)		
	Yoshio Tanigawa		
<a href="#">02-01-0001</a>			
67	Shigeru Iitaka (Gakushuin Univ.*)	(A,B,C) perfect numbers .....	10

## Geometry

March 16th (Mon)

### 9:40–11:40

- [03-01-0001](#)  
1 Takahiko Yoshida (Meiji Univ.) Adiabatic limits, theta functions, and geometric quantization . . . . . 15
- [03-01-0003](#)  
2 Ken Kuwata (Hokkaido Univ.)  
Masao Jinzenji (Hokkaido Univ.) Holomorphic vector field and topological sigma model on  $\mathbb{P}^1$  world sheet  
. . . . . 15
- [03-01-0007](#)  
3 Natsuo Miyatake (Osaka Univ.)<sup>b</sup> A direct proof of Hitchin–Kobayashi type correspondences for abelian  
vortex equations . . . . . 15
- [03-01-0010](#)  
4 Yasufumi Nitta (Tokyo Univ. of Sci.)  
Shunsuke Saito (RIKEN/Kyoto Univ.) A uniform version of the Yau–Tian–Donaldson correspondence for po-  
larized toric manifolds . . . . . 15
- [03-01-0013](#)  
5 Kazuyuki Hasegawa (Kanazawa Univ.)  
Vicente Cortés (University of Hamburg) A construction of a hypercomplex manifold from a quaternionic man-  
ifold —the quaternionic/hypercomplex-correspondence— . . . . . 15
- [03-01-0023](#)  
6 Yoshinori Hashimoto (Tokyo Tech)  
Julien Keller (Aix-Marseille Univ.) Kobayashi–Hitchin correspondence and the Quot-scheme limit of Fubini–  
Study metrics . . . . . 15
- [03-01-0026](#)  
7 Takahiro Aoi (Osaka Univ.) Complete scalar-flat Kähler metrics on affine algebraic manifolds . . . . . 15
- 14:20–15:45**
- [03-01-0012](#)  
8 Tomoya Nakamura (Waseda Univ.) Dirac pairs on Jacobi bialgebroids . . . . . 15
- [03-01-0020](#)  
9 Ryuma Orita (Tokyo Metro. Univ.) Rigid fibers of spinning tops . . . . . 15
- [03-01-0027](#)  
10 Yuuki Sasaki (Univ. of Tsukuba) Connectedness and homogeneity of antipodal sets . . . . . 15
- [03-01-0028](#)  
11 Mao Okada (Univ. of Tokyo) Local rigidity of certain actions of solvable groups on the boundaries of  
rank-one symmetric spaces . . . . . 15
- [03-01-0034](#)  
12 Takashi Sakai (Tokyo Metro. Univ.)  
Peter Quast (Univ. of Augsburg) Natural  $\Gamma$ -symmetric structures on  $R$ -spaces . . . . . 15

### 16:00–17:00 Talk Invited by Geometry Section

- [03-02-0001](#)  
Hikaru Yamamoto (Tokyo Univ. of Sci.) Special Lagrangian submanifolds, mean curvature flows and their mirror

March 17th (Tue)

### 9:40–11:50

- [03-01-0009](#)  
13 Yufeng Lu (Osaka Univ.)  
Ettore Minguzzi (Univ. Stud. Firenze)  
Shin-ichi Ohta (Osaka Univ./RIKEN) Singularity theorems on Lorentz–Finsler manifolds . . . . . 10
- [03-01-0014](#)  
14 Atsufumi Honda  
(Yokohama Nat. Univ.)  
Kosuke Naokawa  
(Hiroshima Inst. of Tech.)  
Kentarō Saji (Kobe Univ.)  
Masaaki Umehara (Tokyo Tech)  
Kotaro Yamada (Tokyo Tech) Duality on generalized cuspidal edges preserving singular set images  
and first fundamental forms . . . . . 15

- 03-01-0018  
15 Yoshito Ishiki (Univ. of Tsukuba) On the Assouad dimension and convergence of metric spaces ..... 15
- 03-01-0019  
16 Yoshito Ishiki (Univ. of Tsukuba) A characterization of metric subspaces of full Assouad dimension ..... 15
- 03-01-0024  
17 Nobuhiro Innami (Niigata Univ.) The azimuthal equidistant projection for a Finsler manifold ..... 15
- 03-01-0025  
18 Shin Nayatani (Nagoya Univ.) Optimal embedding and spectral gap of a finite graph ..... 15  
Takumi Gomyou (Nagoya Univ.)  
Toshimasa Kobayashi (Setsunan Univ.)  
Takefumi Kondo (Kagoshima Univ.)
- 03-01-0029  
19 Naoto Satoh (Hokkaido Univ.) Statistical sectional curvature and warped product statistical manifold ..... 15  
Hitoshi Furuhata (Hokkaido Univ.)  
Izumi Hasegawa  
(Hokkaido Univ. of Edu.\*)
- 03-01-0031  
20 Ryunosuke Ozawa (Tohoku Univ.) Geometric and analytic properties of directed graphs under lower Ricci ..... 15  
Yohei Sakurai (Tohoku Univ.) curvature bound  
Taiki Yamada  
(Res. Inst. for Humanity and Nature)

**13:15–14:15 Talk Invited by Geometry Section**

- 03-02-0002  
Ulrich Pinkall (TU Berlin) Discretizing fluids into filaments and sheets

March 18th (Wed)

**9:40–11:35**

- 03-01-0005  
21 Ayato Mitsuishi (Fukuoka Univ.) Certain mini-max values of the  $p$ -energy and packing radii ..... 15
- 03-01-0006  
22 Cong Hung Mai (Kyoto Univ.) Quantitative estimates for the Bakry–Ledoux isoperimetric inequality ..... 10  
Shin-ichi Ohta (Osaka Univ./RIKEN)
- 03-01-0008  
23 Shintaro Akamine (Nagoya Univ.) Bernstein-type theorem for zero mean curvature hypersurfaces admit- ..... 15  
Atsufumi Honda (Yokohama Nat. Univ.)  
Masaaki Umehara (Tokyo Tech)  
Kotaro Yamada (Tokyo Tech)
- 03-01-0011  
24 Doman Takata (Univ. of Tokyo) Towards an infinite-dimensional Atiyah–Singer index theorem ..... 15
- 03-01-0021  
25 Jun O’Hara (Chiba Univ.) Generalization of Willmore energy as a residue ..... 15
- 03-01-0022  
26 Asuka Takatsu (Tokyo Metro. Univ.)<sup>b</sup> Elliptic and parabolic boundary value problems on rotationally sym- ..... 15  
Kazuhiro Ishige (Univ. of Tokyo) metric domains  
Paolo Salani (Univ. Firenze)
- 03-01-0030  
27 Dounnu Sasaki (Waseda Univ.) Denseness property of geodesic currents on a cusped hyperbolic surface ..... 15
- 14:20–15:40**
- 03-01-0004  
28 Atsushi Fujioka (Kansai Univ.) Centraffine surfaces of cohomogeneity one ..... 15  
Hitoshi Furuhata (Hokkaido Univ.)
- 03-01-0015  
29 Masashi Yasumoto (Osaka City Univ.) Discrete Weierstrass-type representations ..... 15
- 03-01-0016  
30 Masahiro Morimoto (Osaka City Univ.) Austere and arid properties for PF submanifolds in Hilbert spaces ..... 15

[03-01-0017](#)  
31 Yuichiro Sato (Tokyo Metro. Univ.) Totally umbilical submanifolds in pseudo-Riemannian space form . . . . 15

[03-01-0033](#)  
32 Kazuhiro Okumura (Asahikawa Nat. Coll. of Tech.) The curvature tensor of ruled real hypersurfaces in a nonflat complex space form . . . . . 10

**16:00–17:00 Talk Invited by Geometry Section**

[03-02-0003](#)  
Atsushi Kanazawa (Kyoto Univ.) Kähler moduli spaces and stability conditions of triangulated categories

# Complex Analysis

March 16th (Mon)

## 9:30–11:50

04-01-0001

- 1 Saburo Saitoh (Gunma Univ.\*/Inst. of Reproducing Kernels) Okumura's disc series can beyond the crucial point of Däumler–Puha's horn torus models for the Riemann sphere ..... 15

04-01-0018

- 2 Toshiyuki Sugawa (Tohoku Univ.) Geometric properties of the nonlinear resolvent for a continuous semi-group of holomorphic self-maps of the unit disk ..... 15  
Mark Elin (ORT Braude Coll.)  
David Shoikhet (Holon Inst. of Tech.)

04-01-0019

- 3 Hideaki Izumi (Chiba Inst. of Tech.) Dimensioned number solutions to iterative functional equations ..... 15

04-01-0012

- 4 Akira Ushijima (Kanazawa Univ.) Existence of exceptional points for cofinite Fuchsian groups ..... 15  
Toshihiro Nakanishi (Shimane Univ.)

04-01-0017

- 5 Takayuki Watanabe (Kyoto Univ.) Dichotomy of Markov random dynamical systems of rational maps ... 15  
Hiroki Sumi (Kyoto Univ.)

04-01-0021

- 6 Masashi Kisaka (Kyoto Univ.) Fatou–Shishikura inequality for transcendental entire functions in class  $\mathcal{S}$  ..... 15

04-01-0010

- 7 Joe Kamimoto (Kyushu Univ.) On the maximal region to which local zeta functions can be meromorphically extended ..... 15  
Toshihiro Nose (Fukuoka Inst. of Tech.)

04-01-0016

- 8 Toshihiro Nose (Fukuoka Inst. of Tech.) On non-polar singularities of local zeta functions ..... 15  
Joe Kamimoto (Kyushu Univ.)

## 14:15–15:20

04-01-0006

- 9 Takanori Ayano (Osaka City Univ.) Series expansion of two-dimensional sigma function based on the heat equations ..... 15  
Victor M. Buchstaber (Steklov Inst. of Math.)

04-01-0009

- 10 Atsushi Hayashimoto Automorphism group and isometry group of Hua domains ..... 15  
(Nagano Nat. Coll. of Tech.)

04-01-0013

- 11 Hidetaka Hamada Distortion theorems, Lipschitz continuity and their applications for Bloch type mappings on bounded symmetric domains in  $\mathbb{C}^n$  ..... 15  
(Kyushu Sangyo Univ.)

04-01-0014

- 12 Ian Graham (Univ. of Toronto) Loewner chains, Bloch mappings and Pfaltzgraff–Suffridge extension operators on bounded symmetric domains ..... 15  
Hidetaka Hamada (Kyushu Sangyo Univ.)  
Gabriela Kohr (Babeş-Bolyai Univ.)

## 15:35–16:35 Talk Invited by Complex Analysis Section

04-02-0003

- Yohei Komori (Waseda Univ.) Growth of hyperbolic Coxeter groups

## 16:50–17:50 Award Lecture for the 2019 MSJ Analysis Prize

04-02-0001

- Hiroki Sumi (Kyoto Univ.) Various randomness-induced phenomena and their mechanisms in random holomorphic dynamical systems

## March 17th (Tue)

**9:15–11:45**

04-01-0005

- 13 Shinichi Tajima (Niigata Univ.)\* A computation method of logarithmic vector fields associated to isolated complete intersection singularities ..... 15  
 Takafumi Shibuta  
 (Kyushu Sangyo Univ.)  
 Katsusuke Nabeshima  
 (Tokushima Univ.)

04-01-0004

- 14 Tomoko Shinohara Local stable set of an indeterminate point of rational mappings of two complex variables ..... 15  
 (Tokyo Metro. Coll. of Ind. Tech.)

04-01-0002

- 15 Yukitaka Abe (Univ. of Toyama) Isogenies between commutative complex Lie groups ..... 10

04-01-0003

- 16 Yukitaka Abe (Univ. of Toyama) Meromorphic function fields closed by partial derivatives ..... 15

04-01-0008

- 17 Takayuki Koike (Osaka City Univ.) Hermitian metrics on the anti-canonical bundle of the blow-up of the projective plane at nine points ..... 15

04-01-0020

- 18 Masanori Adachi (Shizuoka Univ.) The Diederich–Fornæss and Steinness indices in complex manifolds ... 15  
 Jihun Yum (Pusan Nat. Univ.)

04-01-0007

- 19 Takahiro Inayama (Univ. of Tokyo) Pseudonorms on direct images of pluricanonical bundles ..... 15

04-01-0011

- 20 Genki Hosono (Tohoku Univ.) A simplified proof of the optimal  $L^2$  extension theorem and its application ..... 15

04-01-0015

- 21 Takeo Ohsawa (Nagoya Univ.)<sup>b</sup> Application of the  $L^2$  method to the Levi problem on complex manifolds ..... 15

**13:15–14:15 Talk Invited by Complex Analysis Section**

04-02-0002

- Shin-ichi Matsumura (Tohoku Univ.)<sup>b</sup> On structure theorems for projective manifolds with certain non-negative curvature

## Functional Equations

March 16th (Mon)

### 9:00–12:00

- 05-01-0045  
1 Hiroto Inoue (Kyushu Univ.) The exponential matrix solution and power series solution of the matrix-valued Bratu equation ..... 10
- 05-01-0025  
2 Daichi Komori (Hokkaido Univ.) The construction of the morphism of sheaves from pseudodifferential operators to their symbols via Čech–Dolbeault cohomology ..... 10
- 05-01-0022  
3 Masatoshi Suzuki (Tokyo Tech) On a system of partial differential equations and entire functions of Hermite–Biehler class ..... 10
- 05-01-0020  
4 Hidetoshi Tahara (Sophia Univ.) Uniqueness of the solution of nonlinear singular first order partial differential equations ..... 10
- 05-01-0048  
5 Yukihide Tadano (Univ. of Tokyo)  
Shu Nakamura (Gakushuin Univ.) On a continuum limit of discrete Schrödinger operators on square lattices ..... 10
- 05-01-0037  
6 Kenichi Ito (Univ. of Tokyo)  
Arne Jensen (Aalborg Univ.) Hypergeometric expression for resolvent of the discrete Laplacian in low dimension ..... 10
- 05-01-0077  
7 Kanam Park (Kobe Univ.) A certain generalization of  $q$ -Painlevé VI system and its symmetry ... 10
- 05-01-0062  
8 Toshinori Takahashi (Kindai Univ.) On the WKB theoretic transformation to the boosted Airy equation ..... 10
- 05-01-0051  
9 Takashi Aoki (Kindai Univ.)  
Shofu Uchida (Kindai Univ.) Voros coefficients at the origin and at the infinity of the generalized hypergeometric differential equation with a large parameter ..... 10
- 05-01-0005  
10 Hideshi Yamane (Kwansei Gakuin Univ.) Analytic global-in-time solutions to the Cauchy problem for the  $\mu$ -Camassa–Holm equation ..... 10
- 05-01-0066  
11 Kazuki Ishibashi (Hiroshima Nat. Coll. of Maritime Tech.)  
Fentao Wu (Northeast Normal Univ.)  
Lin She Moore-type nonoscillation theorems for half-linear difference equations ..... 10
- 05-01-0028  
12 Tomoyuki Tanigawa (Osaka Pref. Univ.) A study of nonoscillatory solutions of half-linear differential equations by Riccati equations ..... 10
- 05-01-0003  
13 Tetsutaro Shibata (Hiroshima Univ.)  
Keiichi Kato (Tokyo Univ. of Sci.) Simple proof of stationary phase method and application to oscillatory bifurcation problems ..... 10
- 05-01-0011  
14 Yutaka Kamimura (Tokyo Univ. of Marine Sci. and Tech.) Energy dependent reflectionless inverse theory and method ..... 10

### 14:15–16:15

- 05-01-0080  
15 Shingo Takeuchi (Shibaura Inst. of Tech.)  
Kohtaro Watanabe (Nat. Defense Acad. of Japan) Lyapunov-type inequalities for a Sturm–Liouville problem of the one-dimensional  $p$ -Laplacian ..... 10
- 05-01-0036  
16 Tatsuki Mori (Musashino Univ.)  
Kousuke Kuto (Waseda Univ.)  
Yasuhito Miyamoto (Univ. of Tokyo)  
Tohru tsujikawa (Univ. of Miyazaki)  
Shoji Yotsutani (Ryukoku Univ.\*) Parametric representation of a sheet constructed by all solution to a nonlocal Allen–Cahn equation ..... 10

05-01-0033	17 <u>Kenichiro Umezū</u> (Ibaraki Univ.) Uriel Kaufmann (Univ. Nacional de Córdoba) Humberto Ramos Quoirin (Univ. de Santiago de Chile)	Global exact multiplicity of positive solutions for an indefinite sublinear Robin problem . . . . .	10
05-01-0050	18 <u>Yohei Sato</u> (Saitama Univ.) Xiaojun Chang (Northeast Normal Univ.)	Localized solutions of nonlinear Schrödinger systems with critical frequency for infinite attractive case . . . . .	10
05-01-0046	19 <u>Lorenzo Cavallina</u> (Tohoku Univ.) Antoine Henrot (Inst. Elie Cartan de Lorraine/Univ. de Lorraine) Shigeru Sakaguchi (Tohoku Univ.)	On the two-phase isoperimetric problem . . . . .	10
05-01-0024	20 <u>Shigeru Sakaguchi</u> (Tohoku Univ.) Lorenzo Cavallina (Tohoku Univ.) Seiichi Udagawa (Nihon Univ.)	A characterization of the interface with constant temperature in two-phase heat conductors . . . . .	10
05-01-0052	21 <u>Yuki Tsukamoto</u> (Tokyo Tech)	Existence of a prescribed anisotropic mean curvature problem . . . . .	10
05-01-0067	22 <u>Kensuke Yoshizawa</u> (Tohoku Univ.) <sup>b</sup>	Existence and non-existence of elastic graphs with the symmetric cone obstacle . . . . .	10
<b>16:30–17:30 Award Lecture for the 2019 MSJ Analysis Prize</b>			
05-02-0004	<u>Hidetaka Sakai</u> (Univ. of Tokyo)	The world of the Painlevé equations	

## March 17th (Tue)

**9:00–12:00**

05-01-0076	23 <u>Naoki Hamamoto</u> (Osaka City Univ.)	Sharp Rellich inequality for vector-valued functions under the solenoidal condition . . . . .	10
05-01-0049	24 <u>Megumi Sano</u> (Hiroshima Univ.)	Minimization problem associated with an improved Hardy–Sobolev type inequality . . . . .	10
05-01-0055	25 <u>Takeshi Suguro</u> (Tohoku Univ.) <sup>b</sup>	Shannon’s inequality for a generalized entropy and an application to the uncertainty principle . . . . .	10
05-01-0014	26 <u>Shoya Kawakami</u> (Saitama Univ.) <u>Takeyuki Nagasawa</u> (Saitama Univ.)	Estimates on variational formulae of O’Hara’s energies . . . . .	10
05-01-0031	27 <u>Aya Ishizeki</u> (Chiba Univ.) <u>Takeyuki Nagasawa</u> (Saitama Univ.)	Upper and lower bounds and modulus of continuity of decomposed Möbius energies . . . . .	10
05-01-0032	28 <u>Takeyuki Nagasawa</u> (Saitama Univ.) <u>Kohei Nakamura</u> (Saitama Univ.)	Asymptotic analysis for non-local curvature flows for plane curves with general rotation number . . . . .	10
05-01-0058	29 <u>Ken Furukawa</u> (Univ. of Tokyo) <u>Naoto Kajiwara</u> (Tokyo Univ. of Sci.)	On the solvability of higher-order elliptic equations . . . . .	10
05-01-0027	30 <u>Hirotsada Honda</u> (Toyo Univ.)	Mathematical analysis on a target detection model . . . . .	10
05-01-0015	31 <u>Junpei Inoue</u> (Univ. of Electro-Comm.) <u>Kousuke Kuto</u> (Waseda Univ.)	On the optimal distribution and the existence of an $L^1$ -unbounded sequence of steady states for the diffusive logistic equation . . . . .	10

- 05-01-0034  
32 Masahiko Shimojyou (Okayama Univ. of Sci.)  
Jong-Shenq Guo (Tamkang Univ.)  
Yu-Shuo Chen (Tamkang Univ.) Spreading speed of a singular prey-predator type reaction-diffusion system ..... 10
- 05-01-0035  
33 Masahiko Shimojyou (Okayama Univ. of Sci.)  
Jong-Shenq Guo (Tamkang Univ.)  
Yu-Shuo Chen (Tamkang Univ.) Traveling wave solution to a singular prey-predator reaction diffusion system ..... 10
- 05-01-0057  
34 Tomoyuki Oka (Tohoku Univ.)  
Goro Akagi (Tohoku Univ.) Space-time homogenization for the fast diffusion equation ..... 10
- 05-01-0043  
35 Kenta Nakamura (Tohoku Univ.)  
Masashi Misawa (Kumamoto Univ.)  
Tuomo Kuusi (Univ. of Helsinki) Global existence for the  $p$ -Sobolev flow ..... 10
- 05-01-0001  
36 Mario Fuest (Paderborn Univ.)  
Johannes Lankeit (Paderborn Univ.)  
Masaaki Mizukami (Tokyo Univ. of Sci.) Asymptotic behavior in a chemotaxis-consumption model with realistic boundary conditions for the oxygen ..... 10
- 05-01-0041  
37 Takashi Suzuki (Osaka Univ.) A parabolic concavity maximum principle ..... 5

**13:15–14:15 Talk Invited by Functional Equations Section**

- 05-02-0002  
Sohei Ashida (Gakushuin Univ.) Accurate lower bounds for eigenvalues of electronic Hamiltonians

March 18th (Wed)

**9:00–12:00**

- 05-01-0029  
38 Toshikazu Kuniya (Kobe Univ.) Threshold theorem for an SIR epidemic model with diffusion under the different boundary conditions ..... 10
- 05-01-0063  
39 Daesu Jeong (Nagoya Univ.) The role of forward self-similar solutions in the Cauchy problem for semi-linear heat equations with exponential nonlinearity ..... 10
- 05-01-0068  
40 Kotaro Hisa (Tohoku Univ.)  
Kazuhiro Ishige (Univ. of Tokyo)  
Jin Takahashi (Tokyo Tech) Existence of solutions for an inhomogeneous fractional semilinear heat equation ..... 10
- 05-01-0075  
41 Md Rabiul Haque (Tohoku Univ.)<sup>b</sup>  
Norisuke Ioku (Tohoku Univ.)  
Takayoshi Ogawa (Tohoku Univ.)  
Ryuichi Sato (Tohoku Univ.) Critical existence to a convection-diffusion equation in a uniformly local lebesgue space ..... 10
- 05-01-0030  
42 Sachiko Ishida (Chiba Univ.)  
Tomomi Yokota (Tokyo Univ. of Sci.) Weak stabilization in Keller–Segel systems with degenerate diffusion ..... 10
- 05-01-0054  
43 Mikihiro Fujii (Kyushu Univ.) Global solutions to the dissipative quasi-geostrophic equation with dispersive forcing ..... 10
- 05-01-0026  
44 Masaki Kurokiba (Muroran Inst. of Tech.)<sup>b</sup>  
Takayoshi Ogawa (Tohoku Univ./Tohoku Univ.) Singular limit problem for the Keller–Segel system and drift-diffusion system ..... 10

- 05-01-0079  
45 Shuji Yoshikawa (Oita Univ.) Error estimates of structure-preserving discrete approximations for the Cahn–Hilliard equation in two space dimension ..... 10
- 05-01-0002  
46 Takashi Furuya (Nagoya Univ.) Direct and inverse scattering problems for the local perturbation of an open periodic waveguide in the half plane ..... 10
- 05-01-0012  
47 Kunio Hidano (Mie Univ.)  
Kazuyoshi Yokoyama  
(Hokkaido Univ. of Sci.) Global existence for null-form wave equations with data in a Sobolev space of lower regularity and weight ..... 10
- 05-01-0044  
48 Tadahiro Oh (Univ. of Edinburgh)  
Mamoru Okamoto (Shinshu Univ.) On the well-posedness for the quadratic stochastic nonlinear wave equation with a rough noise in two dimensions ..... 10
- 05-01-0004  
49 Haruya Mizutani (Osaka Univ.)  
Xiaohua Yao  
(Central China Normal Univ.) Resolvent and Strichartz estimates for fractional Schrödinger operators with Hardy potentials ..... 10
- 05-01-0072  
50 Tomoyuki Tanaka <sup>b</sup>  
(Nagoya Univ./Chuo Univ./RIKEN/Keio Univ.)  
Masahiro Ikeda (RIKEN/Keio Univ.)  
Kyouhei Wakasa  
(Kushiro Nat. Coll. of Tech.) Global well-posedness for the wave equation with a time-dependent scale invariant damping and a cubic convolution ..... 10
- 05-01-0019  
51 Yoshiyuki Kagei (Tokyo Tech)  
Hiroshi Takeda (Fukuoka Inst. of Tech.) Large time behavior of global solutions to nonlinear elastic wave equations with strong damping term ..... 10
- 14:15–16:15**
- 05-01-0071  
52 Isao Kato (Kyoto Univ.)  
Shinya Kinoshita (Univ. Bielefeld) On the 3D Zakharov system with radial initial data ..... 10
- 05-01-0061  
53 Ikkei Shimizu (Kyoto Univ.) Local well-posedness for Schrödinger maps with helicity terms ..... 10
- 05-01-0017  
54 Chunhua Li (Yanbian Univ.)  
Yoshinori Nishii (Osaka Univ.)  
Yuji Sagawa  
Hideaki Sunagawa (Osaka Univ.) Large time asymptotics for a cubic nonlinear Schrödinger system in one space dimension ..... 10
- 05-01-0056  
55 Koichi Komada  
(Tohoku Univ./Kyushu Univ.) Existence of blow-up solutions to nonlinear Schrödinger equations with anisotropic fourth-order dispersion ..... 10
- 05-01-0073  
56 Takuya Sato (Tohoku Univ.)<sup>b</sup>  
Takayoshi Ogawa (Tohoku Univ.)  $L^2$ -decay for the one dimensional dissipative nonlinear Schrödinger equation in a critical exponent ..... 10
- 05-01-0059  
57 Toshiyuki Suzuki (Kanagawa Univ.) Nonlinear Schrödinger equations with an inverse-square potential and a repulsive harmonic oscillator ..... 10
- 05-01-0069  
58 Masaru Hamano (Saitama Univ.)  
Masahiro Ikeda (RIKEN/Keio Univ.) For a stationary problem of the nonlinear Schrödinger equation with a potential term ..... 10
- 05-01-0070  
59 Noriyoshi Fukaya (Tokyo Univ. of Sci.)  
Masayuki Hayashi (Kyoto Univ.) Instability of algebraic standing waves for nonlinear Schrödinger equations with double power nonlinearities ..... 10
- 16:30–17:30 Talk Invited by Functional Equations Section**
- 05-02-0003  
Kousuke Kuto (Waseda Univ.) Cross-diffusion limit in the stationary SKT model

## March 19th (Thu)

**9:00–12:00**

05-01-0047

- 60 Shota Sakamoto (Tohoku Univ.) Solutions to initial and initial-boundary value problems of the non-cutoff Boltzmann equation near an equilibrium ..... 10  
 Renjun Duan  
 (Chinese Univ. of Hong Kong)  
 Shuangqian Liu  
 (Central China Normal Univ./Jinan Univ.)  
 Robert M. Strain (Univ. Pennsylvania)

05-01-0021

- 61 Hirokazu Saito (Tokyo Univ. of Sci.) On elliptic problems associated with two-phase incompressible flows in unbounded domains ..... 10  
 Xin Zhang (Waseda Univ.)

05-01-0078

- 62 Zhongyang Gu (Univ. of Tokyo) Continuous alignment of vorticity direction prevents the blow-up of the Navier–Stokes flow under the no-slip boundary condition ..... 10  
 Yoshikazu Giga (Univ. of Tokyo)  
 Pen-Yuan Hsu (Univ. of Tokyo)

05-01-0042

- 63 Kenji Nakamura (Tsukuba Univ.) Linearized problem of the hyperbolic type Navier–Stokes equations in the three dimensional half-spaces ..... 10  
 Takayuki Kobayashi (Osaka Univ.)  
 Takayuki Kubo (Ochanomizu Univ.)

05-01-0060

- 64 Tomoki Takahashi (Nagoya Univ.) Attainability of a stationary Navier–Stokes flow around a rigid body rotating from rest ..... 10

05-01-0016

- 65 Akira Okada (Kyoto Univ.) Necessary and sufficient condition for the local existence of solution in the Serrin class of the Navier–Stokes equations ..... 10

05-01-0074

- 66 Takahiro Okabe (Osaka Univ.) Annihilation of slow-decay factors of the Navier–Stokes flow by the external force ..... 10  
 Lorenzo Brandolese (Univ. Lyon 1)

05-01-0013

- 67 Hiroyuki Tsurumi (Waseda Univ.) The two-dimensional stationary Navier–Stokes equations in toroidal Besov spaces ..... 10

05-01-0018

- 68 Kazuyuki Tsuda (Osaka Univ.) The time periodic problem of the Navier–Stokes equations in a bounded domain with moving boundary ..... 10  
 Reinhard Farwig (TU Darmstadt)  
 Hideo Kozono (Waseda Univ.)  
 David Wegmann (TU Darmstadt)

05-01-0008

- 69 Yoshihiro Shibata (Waseda Univ.) On the second Helmholtz decomposition in an exterior domain ..... 10

05-01-0006

- 70 Yoshihiro Shibata (Waseda Univ.) On the isothermal compressible multi-component mixture flow: the local existence and maximal  $L_p$ - $L_q$  regularity of solutions ..... 10

05-01-0007

- 71 Yoshihiro Shibata (Waseda Univ.) On the maximal  $L_p$ - $L_q$  regularity of solutions to a general linear parabolic system ..... 10

05-01-0009

- 72 Yoshihiro Shibata (Waseda Univ.) On the  $\mathcal{R}$ -solver and periodic solutions ..... 10

05-01-0010

- 73 Yoshihiro Shibata (Waseda Univ.) On the periodic solutions for free boundary problem of the Navier–Stokes equations ..... 10

**14:15–16:15**

05-01-0023

- 74 Senjo Shimizu (Kyoto Univ.) Maximal  $L^1$ -regularity for the parabolic initial-boundary value problem in the half-space ..... 10  
 Takayoshi Ogawa (Tohoku Univ.)

05-01-0065

- 75 Tsukasa Iwabuchi (Tohoku Univ.) Forward self-similar solutions for compressible Navier–Stokes equations ..... 10  
 Pierre Germain (New York Univ.)

05-01-0081

- 76 Ryosuke Nakasato (Tohoku Univ.) Global well-posedness and time-decay estimates for the compressible  
Shuichi Kawashima (Waseda Univ.) Hall-magnetohydrodynamic system ..... 10  
Takayoshi Ogawa (Tohoku Univ.)

05-01-0053

- 77 Kai Koike (Keio Univ./RIKEN) Long-time behavior of a pendulum in a 1D viscous compressible fluid  
 ..... 10

05-01-0064

- 78 Keiichi Watanabe (Waseda Univ.) Global solvability of the Navier–Stokes–Korteweg equations with a non-  
 decreasing pressure in  $L^p$ -framework ..... 10

05-01-0038

- 79 Masahiro Suzuki (Nagoya Inst. of Tech.) The Morrow model of gas discharge I: Stability analysis ..... 10  
Atusi Tani (Keio Univ.\*)

05-01-0039

- 80 Masahiro Suzuki (Nagoya Inst. of Tech.) The Morrow model of gas discharge II: Global bifurcation ..... 10  
Walter Strauss (Brown Univ.)

05-01-0040

- 81 Masahiro Suzuki (Nagoya Inst. of Tech.) Justification of the Boltzmann relation ..... 10  
Emmanuel Grenier (ENS de Lyon)  
Yan Guo (Brown Univ.)  
Benoit Pausader (Brown Univ.)

### 16:30–17:30 Talk Invited by Functional Equations Section

05-02-0001

- Jun-ichi Segata (Kyushu Univ.) Long time behavior of solution to the nonlinear Schrödinger equation  
 with delta potential

# Real Analysis

March 18th (Wed)

## 9:00–11:50

06-01-0021

- 1 Toshiharu Kawasaki (Nihon Univ.) The split feasibility problem with some projections in Banach spaces  
 Hiroko Manaka (Nihon Univ.) ..... 15

06-01-0026

- 2 Yukino Tomizawa Uniform convexity in distance spaces ..... 15  
 (Niigata Inst. of Tech.)

06-01-0012

- 3 Hiroyasu Mizuguchi (Kansai Univ.) A certain geometric constant and von Neumann–Jordan constant in  
 Radon planes ..... 15

06-01-0010

- 4 Kichi-Suke Saito (Niigata Univ.) A note on the structure of Radon spaces ..... 15  
 Naoto Komuro  
 (Hokkaido Univ. of Edu.)  
 Ryotaro Tanaka (Tokyo Univ. of Sci.)

06-01-0024

- 5 Toshiharu Kawasaki Integrable functions for extended integration ..... 15  
 (Nihon Univ./Tamagawa Univ.)

06-01-0031

- 6 Ryoji Fukuda (Oita Univ.) Two non-discretizations for  $k$ -additivity of a monotone measure ..... 15  
 Aoi Honda (Kyushu Inst. of Tech.)  
 Yoshiaki Okazaki  
 (Fuzzy Logic Systems Inst.)

06-01-0005

- 7 Shohei Nakamura (Tokyo Metro. Univ.) The tomography approach to the Fourier restriction theory ..... 15  
 Jonathan Bennett  
 (Univ. of Birmingham)

06-01-0001

- 8 Takeshi Iida Weighted norm inequalities on Morrey spaces for the Orlicz-fractional  
 maximal operators ..... 15  
 (Fukushima Nat. Coll. of Tech.)

06-01-0009

- 9 Ryota Kawasumi Generalized fractional integral operators on weak Orlicz spaces ..... 15  
 Eiichi Nakai (Ibaraki Univ.)

06-01-0020

- 10 Minglei Shi (Ibaraki Univ.) Commutators of Calderón–Zygmund and generalized fractional integral  
 operators with functions in generalized Campanato spaces on Orlicz–  
 Morrey spaces ..... 15  
 Ryutaro Arai (Ibaraki Univ.)  
 Eiichi Nakai (Ibaraki Univ.)

## 14:15–15:55

06-01-0027

- 11 Tsukasa Iwabuchi (Tohoku Univ.) Bilinear estimates in Sobolev spaces associated with Dirichlet and Neu-  
 mann Laplacian ..... 15

06-01-0025

- 12 Ryoichi Kunisada (Waseda Univ.) On a continuous version of Banach limits ..... 15

06-01-0028

- 13 Toru Nogayama (Tokyo Metro. Univ.) Local Muckenhoupt class for variable exponents ..... 15  
 Yoshihiro Sawano (Tokyo Metro. Univ.)

06-01-0017

- 14 Yoshihiro Sawano (Tokyo Metro. Univ.)<sup>b</sup> Cantor functions associated with generalized expansions ..... 15

06-01-0018

- 15 Yoshihiro Sawano (Tokyo Metro. Univ.)<sup>b</sup> Sparse non-smooth atomic decomposition of Morrey spaces ..... 15

06-01-0019

- 16 Yoshihiro Sawano (Tokyo Metro. Univ.)<sup>b</sup> Modified Hardy–Littlewood maximal operator and modified fractional  
 integral operator on metric measure spaces ..... 15  
 Tetsu Shimomura (Hiroshima Univ.)

**16:15–17:15 Talk Invited by Real Analysis Section**

06-02-0002

Gaku Sadasue (Osaka Kyoiku Univ.) Some martingale spaces and fractional integrals for martingale

March 19th (Thu)

**9:00–12:00**

06-01-0014

17 Masaaki Mizukami (Tokyo Univ. of Sci.) Uniform-in-time convergence of solutions for a chemotaxis-competition model to those for the Lotka–Volterra competition model ..... 15

06-01-0002

18 Pierluigi Colli (Univ. of Pavia) Existence for a phase separation system deduced from the entropy balance ..... 15  
Shunsuke Kurima (Tokyo Univ. of Sci.)

06-01-0004

19 Shunsuke Kurima (Tokyo Univ. of Sci.) A Cahn–Hilliard approach to a nonlinear diffusion chemotaxis system ..... 15

06-01-0029

20 Keiichiro Kagawa (Waseda Univ.) Asymptotic limits of the time-periodic problem for the viscous Cahn–Hilliard equation ..... 10  
Mitsuharu Ôtani (Waseda Univ.)

06-01-0003

21 Chiharu Kosugi (Japan Women’s Univ.) Existence of weak solutions to initial boundary value problems describing shrinking motion of elastic materials ..... 15  
Toyohiko Aiki (Japan Women’s Univ.)

06-01-0030

22 Takahiro Kishida (Meijo Univ.) FEM analysis for mathematical model of adsorption phenomena in 1D domain ..... 15  
Yusuke Murase (Meijo Univ.)

06-01-0022

23 Kazuki Shimura (Oita Univ.) Structure-preserving finite difference schemes for a Cahn–Hilliard system coupled with elasticity ..... 15  
Shuji Yosikawa (Oita Univ.)

06-01-0007

24 Makoto Okumura (Osaka Univ.) A structure-preserving scheme for the Cahn–Hilliard equation with dynamic boundary conditions which has the total mass conservation ..... 15

06-01-0032

25 Yoshimasa Sasaki (Niigata Univ.) Existence and uniqueness of solutions to conservation laws with spatially discontinuous flux ..... 15  
Ohwa Hiroki (Niigata Univ.)

06-01-0023

26 Hiroshi Watanabe (Oita Univ.) Construction of traveling waves and asymptotic behavior of entropy solutions to scalar parabolic-hyperbolic conservation laws ..... 15

06-01-0033

27 Yutaka Tsuzuki (Hiroshima Shudo Univ.) Existence for Initial-boundary value problems for Vlasov–Poisson equations with angle error in magnetic field ..... 15

**14:15–15:55**

06-01-0015

28 Noriaki Yamazaki (Kanagawa Univ.) Control of parameter-dependent evolution equations governed by time-dependent subdifferentials ..... 15  
Nobuyuki Kenmochi (Chiba Univ.\*)  
Ken Shirakawa (Chiba Univ.)

06-01-0013

29 Shodai Kubota (Chiba Univ.) Optimal control problem for multidimensional semi-discrete system of Kobayashi–Warren–Carter type ..... 15  
Ken Shirakawa (Chiba Univ.)

06-01-0011

30 Ken Shirakawa (Chiba Univ.) Sufficient condition for the existence of one-dimensional crystalline solution of the Kobayashi–Warren–Carter type system ..... 15  
Hiroshi Watanabe (Oita Univ.)

06-01-0016

31 Kota Kumazaki (Nagasaki Univ.) A one-dimensional free boundary problem related to ice lenses formation ..... 15

06-01-0008

32 Takeshi Fukao (Kyoto Univ. of Edu.) Vanishing diffusion in a dynamic boundary condition for the Cahn–Hilliard equation ..... 15  
Pierluigi Colli (Pavia Univ.)

06-01-0006

33 Akio Ito Approach from the quasi-variational structure to tumor invasion with non-smooth degenerate diffusion ..... 15

**16:15–17:15 Talk Invited by Real Analysis Section**

06-02-0001

Keisuke Takasao

<sup>b</sup> On the existence of the weak solution for the mean curvature flow with forcing term via the phase field method  
(Kyoto Univ./Kyoto Univ.)

## Functional Analysis

March 16th (Mon)

**10:00–11:45**

07-01-0022

- 1 Amane Kiyose (Kobe Univ.) On the Mourre estimates for Floquet Hamiltonians ..... 15  
 Tadayoshi Adachi (Kyoto Univ.)

07-01-0017

- 2 Daisuke Kawagoe (Kyoto Univ.) Surface Riesz transforms and spectral property of the elastic Neumann–  
 Hyeonbae Kang (Inha Univ.) Poincaré operator on less smooth domains in three dimensions ..... 15

07-01-0018

- 3 Daisuke Kawagoe (Kyoto Univ.) The essential spectrum of the elastic Neumann–Poincaré operator on a  
 Eric Bonnetier (Univ. Grenoble-Alpes) planar domain with a corner ..... 15  
 Charles Dapogny  
 (Univ. Grenoble-Alpes)  
 Hyeonbae Kang (Inha Univ.)

07-01-0015

- 4 Hiroshi Inoue (Daiichi Univ. of Pharm.) Quantum dynamics based on non-self-adjoint hamiltonians ..... 15

07-01-0009

- 5 Yoritaka Iwata (Kansai Univ.) Abstract Miura transform based on the logarithmic representation of  
 operators ..... 15

07-01-0001

- 6 Shuji Watanabe (Gunma Univ.) An operator-theoretical treatment of the specific heat of a supercon-  
 ductor in the BCS-Bogoliubov model of superconductivity ..... 15

**14:15–15:15 Award Lecture for the 2019 MSJ Analysis Prize**

07-02-0001

- Fumio Hiroshima (Kyushu Univ.) Renormalization theory and non-perturbative analysis of ground states  
 by functional integrations

**15:30–16:30 Talk Invited by Functional Analysis Section**

07-02-0003

- Fumihiko Nakano (Gakushuin Univ.) Scaling limit of the eigenvalues and eigenfunctions of 1-dimensional  
 random Schrödinger operators

March 17th (Tue)

**10:30–11:45**

07-01-0020

- 7 Koei Kawamura (Kyoto Univ.)<sup>b</sup> Decomposition of spherical representations and an addition theorem for  
 multivariate hypergeometric polynomials ..... 15

07-01-0010

- 8 Koichi Arashi (Nagoya Univ.) Holomorphic multiplier representations for bounded homogeneous do-  
 mains ..... 15

07-01-0004

- 9 Taito Tauchi (Univ. of Tokyo) A generalization of the uniformly bounded multiplicity theorem ..... 15

07-01-0016

- 10 Toshihisa Kubo (Ryukoku Univ.) The  $K$ -type formulas for Kable's differential operators of type  $A_3$  and  
 Bent Ørsted (Aarhus Univ.) Heun polynomials ..... 15

**13:15–14:15 Talk Invited by Functional Analysis Section**

07-02-0004

- Ryosuke Nakahama (Univ. of Tokyo) Construction of intertwining operators for restriction of holomorphic  
 discrete series representations

March 18th (Wed)

**9:45–12:00**

07-01-0021

- 11 Hiroshi Isa (Maebashi Inst. of Tech.) The  $n$ -th Petz–Bregman divergence and the  $n$ -th residual relative operator entropy ..... 15  
 Eizaburo Kamei  
 Hiroaki Tohyama  
 (Maebashi Inst. of Tech.)  
 Masayuki Watanabe  
 (Maebashi Inst. of Tech.)

07-01-0008

- 12 Masatoshi Ito (Maebashi Inst. of Tech.) Furuta type inequalities related to Ando–Hiai inequality with negative powers ..... 10  
 Eizaburo Kamei

07-01-0013

- 13 Reo Tojo (Osaka Kyoiku Univ.) Matrix Hölder–McCarthy inequality via matrix geometric means ..... 10  
 Yuki Seo (Osaka Kyoiku Univ.)  
 Ryosuke Nakayama  
 (Osaka Kyoiku Univ.)

07-01-0014

- 14 Ryosuke Nakayama Reverse matrix quasi-arithmetic power means via matrix geometric means ..... 10  
 (Osaka Kyoiku Univ.)  
 Yuki Seo (Osaka Kyoiku Univ.)  
 Reo Tojo (Osaka Kyoiku Univ.)

07-01-0006

- 15 Yuki Seo (Osaka Kyoiku Univ.) Norm inequalities for deformed operator means ..... 10

07-01-0005

- 16 Junichi Fujii (Osaka Kyoiku Univ.) Matrix means for a fixed rank positive semi-definite matrices ..... 15

07-01-0002

- 17 Mitsuru Uchiyama Operator functions and operator means ..... 15  
 (Shimane Univ.\* / Ritsumeikan Univ.)

07-01-0007

- 18 Takeaki Yamazaki (Toyo Univ.) A generalization of the Aluthge transformation in the viewpoint of operator means ..... 15

**14:15–15:10**

07-01-0003

- 19 Chris Bruce (Univ. of Victoria) Partition functions as  $C^*$ -dynamical invariants and actions of congruence monoids ..... 15  
 Marcelo Laca (Univ. of Victoria)  
 Takuya Takeishi (Kyoto Inst. Tech.)

07-01-0011

- 20 Tsuyoshi Kajiwara (Okayama Univ.) Dimension group of the  $C^*$ -algebras associated with self-similar maps with higher dimensional branched points set ..... 15  
 Yasuo Watatani (Kyushu Univ.\*)

07-01-0019

- 21 Hiroyasu Hamada  $C^*$ -algebras generated by multiplication operators and composition operators by functions with self-similar branches ..... 15  
 (Sasebo Nat. Coll. of Tech.)

**15:20–16:20 Talk Invited by Functional Analysis Section**

07-02-0002

- Keiichi Watanabe (Niigata Univ.) On Möbius gyrovector spaces and a class of continuous mappings between them

## Statistics and Probability

March 16th (Mon)

### 9:20–11:55

- 08-01-0012  
1 Kiyoi Hoshino (Osaka Pref. Univ.) On a Riemann approximation of the stochastic integral ..... 15
- 08-01-0023  
2 Shigeyoshi Ogawa (Ritsumeikan Univ.) A noncausal counterpart of Girsanov's theorem ..... 10
- 08-01-0002  
3 Yuki Ueda (Hokkaido Univ.) Free max-probability theory ..... 15
- 08-01-0017  
4 Shoto Osaka (Yokohama Nat. Univ.) On the rate of convergence for Takagi class functions ..... 15  
Masato Takei (Yokohama Nat. Univ.)
- 08-01-0022  
5 Yuto Nakajima (Kyoto Univ.) Connectedness of connectedness locus for fractal  $n$ -gons and the remarkable subset ..... 15
- 08-01-0006  
6 Yu Ito (Kyoto Sangyo Univ.) Integration with respect to Hölder rough paths of order greater than  $1/4$ : an approach via fractional calculus ..... 15
- 08-01-0024  
7 Yosuke Kawamoto (Fukuoka Dental Coll.) Transitions of generalised Bessel kernels related to biorthogonal ensembles ..... 15
- 08-01-0025  
8 Shota Osada (Kyushu Univ.) Isomorphism between determinantal point processes and Poisson point processes ..... 15
- 08-01-0007  
9 Yuta Arai (Chiba Univ.) The KPZ fixed point for discrete time TASEP ..... 15

### 14:15–15:00

- 08-01-0028  
10 Kouhei Matsuura (Kyoto Univ.) Hölder continuity of Neumann heat kernels on a class of planar domains ..... 15
- 08-01-0027  
11 Toshihiro Uemura (Kansai Univ.) Global path properties of symmetric stable processes with singular/degenerate coefficients ..... 15  
Haruna Okamura (Kansai Univ.)
- 08-01-0026  
12 Atsushi Takeuchi (Tokyo Woman's Christian Univ.) Gradient formula for jump processes on manifolds ..... 15

### 15:15–16:15 Talk Invited by Statistics and Probability Section

- 08-02-0002  
Dai Taguchi (Okayama Univ.) Numerical analysis of stochastic differential equations

### 16:30–17:30 Talk Invited by Statistics and Probability Section

- 08-02-0004  
Benoît Collins (Kyoto Univ.)<sup>b</sup> On the operator norm of random matrices

March 17th (Tue)

### 9:10–11:25

- 08-01-0005  
13 Hayato Takahashi (Random Data Lab.) Martin-Löf random sets and consistent theorem of posterior distributions ..... 15
- 08-01-0035  
14 Naoyuki Ichihara (Aoyama Gakuin Univ.) Convergence of value functions for finite horizon Markov decision processes with boundary conditions ..... 15
- 08-01-0033  
15 Masaaki Tsuchiya (Kanazawa Univ.\*)<sup>b</sup> Markov processes controlled by clocks with variable motion on a Euclidean space ..... 15

08-01-0013	16 Yuji Hibino (Saga Univ.)	Construction of the canonical representation from a noncanonical representation . . . . .	10
08-01-0008	17 Yushi Hamaguchi (Kyoto Univ.)	Time-inconsistent consumption-investment problems under general discount functions . . . . .	15
08-01-0030	18 Noriyoshi Sakuma (Aichi Univ. of Edu.) Ryoichi Suzuki (Keio Univ.)	A Clark–Ocone–Haussmann type formula under change of measure for $L^1$ -canonical additive processes and its applications . . . . .	10
08-01-0029	19 Toru Sera (Kyoto Univ.) Kouji Yano (Kyoto Univ.) Yu Ito (Kyoto Sangyo Univ.)	Resolution of sigma-fields for multiparticle finite-state action evolutions with infinite past . . . . .	15
08-01-0034	20 Tomoki Inoue (Ehime Univ.)	Invariant measures of random dynamical systems with indifferent fixed points . . . . .	15

**11:30–12:00 Research Section Assembly**

March 18th (Wed)

**9:00–12:00**

08-01-0009	21 Yuichi Goto (Waseda Univ.)	Estimation of trigonometric moments for circular distribution of MA(p) type by using binary series . . . . .	10
08-01-0032	22 Akitoshi Kimura (Waseda Univ.)	The asymptotic variance estimators of the correlation estimator between latent processes and their asymptotic properties . . . . .	15
08-01-0015	23 Fumiya Akashi (Univ. of Tokyo) Holger Dette (Ruhr-Univ. Bochum)	Robust regression on hyper-spheres with unspecified heteroscedastic errors . . . . .	15
08-01-0016	24 Fumiya Akashi (Univ. of Tokyo) Junichi Hirukawa (Niigata Univ.) Konstantinos Fokianos (Lancaster Univ.)	Inference for heavy-tailed time varying processes by self-weighting . . . . .	15
08-01-0031	25 Yan Liu (Waseda Univ.) Akitosho Kimura (Waseda Univ.) Masanobu Taniguchi (Waseda Univ.) Hernando Ombao (King Abdullah Univ. of Sci. Tech.)	Persistence diagram for Granger causality . . . . .	15
08-01-0003	26 Ken-ichi Koike (Univ. of Tsukuba)	Attainment conditions for Bayesian information inequalities . . . . .	10
08-01-0004	27 Koji Tsukuda (Univ. of Tokyo)	A note on the weak convergence of the posterior process when the Pitman–Yor process prior is placed . . . . .	15
08-01-0020	28 Yoshihide Kakizawa (Hokkaido Univ.)	Density ratio/conditional density estimation for nonnegative data . . . . .	15
08-01-0010	29 Nobuhiro Taneichi (Hokkaido Univ. of Edu.) Yuri Sekiya (Hokkaido Univ. of Edu.) Jun Toyama (Inst. for Practical Appl. of Math.)	Approximations of the distributions of test statistics for independence among groups of factors in a multi-way contingency table based on asymptotic expansion . . . . .	15
08-01-0021	30 Kiyotaka Iki (Nihon Univ.)	Parsimonious bivariate t-distribution type symmetry models for square contingency tables . . . . .	15

08-01-0019

- 31 Hiromu Yumiba E\*-optimal balanced third-order designs of resolution  $R^*({10, 01})$  with  
(Int. Center for Academic Exchange)  $N < \nu(m)$  for  $3^m$  factorials ..... 15  
Yoshifumi Hyodo  
(Okayama Univ. of Sci.)

14:15–15:05

08-01-0011

- 32 Yoshihiko Konno Shrinkage estimation of mean for complex multivariate normal distri-  
(Japan Women's Univ.) bution with unknown covariance when  $p > n$  ..... 15  
Satomi Seita (Japan Women's Univ.)

08-01-0014

- 33 Kazuyoshi Yata (Univ. of Tsukuba) Singular value estimation for high-dimensional cross-covariance matrix  
Makoto Aoshima (Univ. of Tsukuba) ..... 15

08-01-0018

- 34 Aki Ishii (Tokyo Univ. of Sci.) A test procedure for high-dimensional eigenvectors ..... 15  
Kazuyoshi Yata (Univ. of Tsukuba)  
Makoto Aoshima (Univ. of Tsukuba)

**15:20–16:20 Talk Invited by Statistics and Probability Section**

08-02-0003

- Rie Enomoto (Seikei Univ.) Consistency of some information criteria in high-dimensional growth  
curve models

**16:35–17:35 Talk Invited by Statistics and Probability Section**

08-02-0001

- Kou Fujimori (Waseda Univ.) The Dantzig selector for statistical models of stochastic processes in  
high-dimensional and sparse settings

## Applied Mathematics

March 16th (Mon)

### 10:00–11:40

09-01-0017

- 1 Masato Kobayashi (Kanagawa Univ.) Answer Henegphan–Petersen’s question on alternating permutations and Euler numbers . . . . . 15

09-01-0027

- 2 Yukie Inaba (Japan Women’s Univ.) Counting rooted spanning forests and Chebyshev polynomials . . . . . 15  
Hajime Fujita (Japan Women’s Univ.)  
Takefumi Kondo (Kagoshima Univ.)

09-01-0006

- 3 Iwao Sato (Oyama Nat. Coll. of Tech.) The partial differential coefficients for the second Bartholdi zeta function  
Shigeki Matsutani (Kanazawa Univ.) of a graph . . . . . 15  
Hideo Mitsunashi (Hosei Univ.)  
Hideaki Morita  
(Muroan Inst. of Tech.)

09-01-0035

- 4 Ayaka Ishikawa (Yokohama Nat. Univ.) The Ihara expressions of the quaternionic Mizuno–Sato zeta functions  
for digraphs . . . . . 15

09-01-0007

- 5 Osamu Kada (Hosei Univ.) Characteristic polynomials and zeta functions of equitably partitioned  
graphs . . . . . 15

09-01-0034

- 6 Hideaki Morita (Muroan Inst. of Tech.) On the determinant expression for graph zeta functions . . . . . 15

### 14:20–16:05

09-01-0016

- 7 Shinya Fujita (Yokohama City Univ.) Recent topics on rainbow connectivity in edge-colored graphs . . . . . 10

09-01-0036

- 8 Michitaka Furuya (Kitasato Univ.) Bounds on self domination number and an edge-deletion operation in  
trees . . . . . 15

09-01-0011

- 9 Kiyoshi Ando Contractible edges and contractible triangles in a 3-connected graph  
(Nat. Inst. of Information/JST ERATO) . . . . . 15  
Yoshimi Egawa (Tokyo Univ. of Sci.)

09-01-0003

- 10 Chie Nara (Meiji Univ.) Continuous flattening of the 2-skeletons of triangular faces in higher  
Jin-ichi Itoh (Sugiyama Jogakuen Univ.) dimensional cross-polytopes . . . . . 15

09-01-0033

- 11 Yasuhide Numata (Shinshu Univ.) The eigenvalues of a matrix defined by the complete graph with selfloops  
Akiko Yazawa (Shinshu Univ.) . . . . . 15

09-01-0040

- 12 Sho Suda (Nat. Defense Acad. of Japan) On the multiplicities of digraph eigenvalues . . . . . 10  
Alexander Gavriluk  
(Pusan Nat. Univ.)

09-01-0021

- 13 Ryoya Fukasaku (Kyushu Univ.) Chromatic numbers of tensor products of graphs and Gröbner basis  
Michitaka Furuya (Kitasato Univ.) . . . . . 15  
Akihiro Higashitani (Osaka Univ.)

### 16:20–17:20 Talk Invited by Applied Mathematics Section

09-02-0003

- Masanori Sawa (Kobe Univ.) On the rationality of classical orthogonal polynomials, quadrature formulas and geometric designs

## March 17th (Tue)

**9:50–11:15**

09-01-0012

- 14 Ryota Hanaoka (Yokohama Nat. Univ.) A time-series analysis based on two-state quantum walk in one dimension ..... 10  
 Norio Konno (Yokohama Nat. Univ.)  
 Shohei Koyama (Yokohama Nat. Univ.)

09-01-0022

- 15 Masahiro Asano (Yokohama Nat. Univ.) Long-time behavior of the Grover walk on the two-dimensional lattice ..... 15  
 Norio Konno (Yokohama Nat. Univ.)  
 Akihiro Narimatsu  
 (Yokohama Nat. Univ.)

09-01-0029

- 16 Takuto Naito (Yokohama Nat. Univ.) Recommendation models based on walks (Part 1) ..... 10  
 Chusei Kiumi (Yokohama Nat. Univ.)  
 Norio Konno (Yokohama Nat. Univ.)  
 Sarato Takahashi  
 (Yokohama Nat. Univ.)

09-01-0030

- 17 Chusei Kiumi (Yokohama Nat. Univ.) Recommendation models based on walks (Part 2) ..... 10  
 Norio Konno (Yokohama Nat. Univ.)  
 Takuto Naito (Yokohama Nat. Univ.)  
 Sarato Takahashi  
 (Yokohama Nat. Univ.)

09-01-0031

- 18 Takashi Komatsu (Univ. of Tokyo) An explicit expression of scattering matrix of a two state quantum walk on one-dimensional lattice by path counting ..... 15  
 Norio Konno (Yokohama Nat. Univ.)  
 Hisashi Morioka (Ehime Univ.)  
 Etsuo Segawa (Yokohama Nat. Univ.)

09-01-0041

- 19 Yusuke Ide (Kanazawa Inst. of Tech.) Relationships between orthonormal polynomial related to the limit distribution of quantum walk and corresponding random walk ..... 15  
 Norio Konno (Yokohama Nat. Univ.)

**11:30–11:50 Presentation Ceremony for the 2019 MSJ Prize for Excellent Young Applied Mathematicians**

## March 18th (Wed)

**9:30–12:00**

09-01-0032

- 20 Ken Nakashima (Shizuoka Univ.) On approximation of 2D persistence modules by interval-decomposables ..... 15  
 Hideto Asashiba (Shizuoka Univ.)  
 Emerson Gaw Escolar  
 (RIKEN/Kyoto Univ.)  
 Michio Yoshiwaki  
 (RIKEN/Kyoto Univ./Osaka City Univ.)

09-01-0025

- 21 Emerson Gaw Escolar Every pair of  $\Lambda$ -interleavings is  $\tilde{\Lambda}$ -interleaved ..... 15  
 (RIKEN/Kyoto Univ.)  
 Killian F. Meehan (Kyoto Univ.)  
Michio Yoshiwaki  
 (RIKEN/Osaka City Univ./Kyoto Univ.)

09-01-0008

- 22 Ippei Obayashi (RIKEN/Tohoku Univ.) Field choice problem on persistent homology ..... 15  
 Michio Yoshiwaki  
 (RIKEN/Osaka City Univ./Kyoto Univ.)

09-01-0020

- 23 Tatsuya Mikami (Kyoto Univ.) First passage percolation on a crystal lattice ..... 15

09-01-0037

- 24 Tatsuki Shimizu (Kyoto Univ.)    Limit theorems in the decomposition theory of multi-parameter persistent homology ..... 15  
Yasuaki Hiraoka (Kyoto Univ.)

09-01-0019

- 25 Emerson Gaw Escolar    Mapping firms' locations in technological space: A topological analysis of patent statistics ..... 15  
 (RIKEN/Kyoto Univ.)  
Yasuaki Hiraoka (Kyoto Univ.)  
Mitsuru Igami (Yale Univ.)  
Yasin Ozcan (MIT Sloan)

09-01-0013

- 26 Yusuke Imoto (Kyoto Univ.)    Data-noise reduction method based on high-dimensional statistics and its application to genetic data ..... 15  
Yasuaki Hiraoka  
 (Kyoto Univ./Kyoto Univ./RIKEN)  
Michio Yoshiwaki (RIKEN)  
Emerson G. Escolar (RIKEN)  
Tomonori Nakamura (Kyoto Univ.)  
Takuya Yamamoto (Kyoto Univ.)  
Mitinori Saitou  
 (Kyoto Univ./Kyoto Univ./Kyoto Univ.)

09-01-0024

- 27 Yusuke Imoto (Kyoto Univ.)    Estimate of gene regulatory network based on dynamical system and statistical causal discovery ..... 15  
Yasuaki Hiraoka  
 (Kyoto Univ./Kyoto Univ./RIKEN)  
Shohei Shimizu (Shiga Univ./RIKEN)  
Takashi Nicholas Maeda (RIKEN)  
Yoji Kojima (Kyoto Univ.)  
Mitinori Saitou  
 (Kyoto Univ./Kyoto Univ./Kyoto Univ.)

**14:30–15:50**

09-01-0009

- 28 Takeshi Gotoda (Nagoya Univ.)    Numerical study of initial configurations leading to collapse in the point-vortex system ..... 15

09-01-0010

- 29 Taito Tauchi (Univ. of Tokyo)    Existence of a conjugate point in the incompressible Euler flow on an ellipsoid ..... 15  
Tsuyoshi Yoneda (Univ. of Tokyo)

09-01-0014

- 30 Takashi Teramoto    Pinned pulse solutions inside a bump type heterogeneity ..... 10  
 (Asahikawa Medical Univ.)  
Peter van Heijster  
 (Queensland Univ. of Tech.)

09-01-0023

- 31 Takayuki Kubo (Ochanomizu Univ.)    On global in time solution to Burgers equation with a time delay .... 15  
Yoshihiro Ueda (Kobe Univ.)

09-01-0039

- 32 Itsuki Watanabe (Waseda Univ.)    Central limit theorem for data-diffusion with linear reactions ..... 15  
Hiroshi Toyozumi (Waseda Univ.)

**16:00–17:00 Talk Invited by Applied Mathematics Section**

09-02-0001

- Sungrim Seirin Lee (Hiroshima Univ.)    Reaction-diffusion equation, its infinite talent in pattern formation of life science

March 19th (Thu)

**9:15–10:50**

09-01-0001

- 33 Shunji Horiguchi    Binomial expansions of Newton's method and comparison of convergence ..... 10

09-01-0002

34 Shunji Horiguchi

Examples of numerical calculations of the binomial expansions of Newton's method ..... 10

09-01-0015

35 Fuminori Sakaguchi (Univ. of Fukui)

A possibility of wider application of an algorithm for solving ODEs by means only of four arithmetical operations among integers ..... 15

09-01-0005

36 Koichi Anada

(Waseda Univ. Senior High School)

Tetsuya Ishiwata

(Shibaura Inst. of Tech.)

Takeo Ushijima (Tokyo Univ. of Sci.)

A remark on asymptotic behavior of blow-up solutions to a quasi-linear parabolic equation for a curve shortening problem ..... 15

09-01-0018

37 Takehiko Kinoshita (Kyushu Univ.)

Watanabe Yoshitaka (Kyushu Univ.)

Mitsuhiro T. Nakao (Waseda Univ.)

On the strong convergence of some approximate operators for resolvents of bounded operators ..... 15

09-01-0026

38 Akitoshi Takayasu (Univ. of Tsukuba)

Jean-Philippe Lessard (McGill Univ.)

Jonathan Jaquette (Brandeis Univ.)

Hisashi Okamoto (Gakushuin Univ.)

Rigorous numerics for nonlinear heat equations in the complex plane of time ..... 15

**11:00–12:00 Talk Invited by Applied Mathematics Section**

09-02-0002

Katsuhisa Ozaki

(Shibaura Inst. of Tech.)

Error-free transformation for matrix multiplication: Basic, applications, and future

# Topology

March 16th (Mon)

## 10:00–12:00

- [10-01-0006](#)  
1 Ryo Horiuchi (Nagoya Univ.)<sup>b</sup> Verschiebung maps among K-groups of truncated polynomial algebras  
..... 10
- [10-01-0017](#)  
2 Shunsuke Kano (Tokyo Tech) Algebraic entropy of sign-stable mutation loops ..... 15  
Tsukasa Ishibashi (Univ. of Tokyo)
- [10-01-0005](#)  
3 Taro Asume (Univ. of Tokyo)<sup>b</sup> On Fatou sets of foliations ..... 15
- [10-01-0024](#)  
4 Atsuhide Mori (Osaka Dental Univ.) Geometry of Bayesian estimation ..... 15
- [10-01-0009](#)  
5 Teruaki Kitano (Soka Univ.) Twisted Alexander polynomials of torus links ..... 10  
Takayuki Morifuji (Keio Univ.)  
Anh T. Tran (Univ. Texas at Dallas)
- [10-01-0010](#)  
6 Yuta Nozaki (Meiji Univ.) Abelian quotients of the  $Y$ -filtration on the homology cylinders via the  
Masatoshi Sato (Tokyo Denki Univ.) LMO functor ..... 15  
Masaaki Suzuki (Meiji Univ.)
- [10-01-0013](#)  
7 Ryoto Tange (Tokyo Denki Univ.) Twisted Alexander polynomials of hyperbolic twist knots and von Dyck  
groups ..... 10
- [10-01-0022](#)  
8 Takefumi Nosaka (Tokyo Tech)  $K_1$ -Alexander twisted polynomials of knots ..... 15

## 14:15–15:15 Talk Invited by Topology Section

- [10-02-0002](#)  
Takayuki Morifuji (Keio Univ.) Twisted Alexander polynomials of hyperbolic knots and links

## 15:30–16:30 Talk Invited by Topology Section

- [10-02-0003](#)  
Naoki Fujita (Univ. of Tokyo) Toric degenerations arising from Newton–Okounkov bodies and cluster  
structures

March 17th (Tue)

## 10:00–12:00

- [10-01-0004](#)  
9 Atsushi Ishii (Univ. of Tsukuba) A multiple group rack and oriented spatial surfaces ..... 10  
Shosaku Matsuzaki (Takushoku Univ.)  
Tomo Murao (Univ. of Tsukuba)
- [10-01-0011](#)  
10 Atsushi Ishii (Univ. of Tsukuba) The fundamental multiple conjugation quandle of a handlebody-knot  
..... 10
- [10-01-0012](#)  
11 Ryoma Kobayashi Infinite presentations for the mapping class group and its twist subgroup  
(Ishikawa Nat. Coll. of Tech.) of a compact non-orientable surface ..... 15  
Genki Omori (Tokyo Univ. of Sci.)
- [10-01-0023](#)  
12 Genki Omori (Tokyo Univ. of Sci.) Dehn twist-crosscap slide presentations for involutions on non-orientable  
Naoki Sakata (Saitama Univ.) surfaces of genus 4 and 5 ..... 15
- [10-01-0014](#)  
13 Takuya Ukida (Tokyo Tech) Genus zero PALF structures on the Akbulut–Yasui plugs ..... 10
- [10-01-0021](#)  
14 Nobutaka Asano (Tohoku Univ.) Vertical 3-manifolds in simplified genus 2 trisections of 4-manifolds ... 15
- [10-01-0002](#)  
15 Masaki Taniguchi (Univ. of Tokyo) Seifert hypersurfaces of 2-knots and Chern–Simons functional ..... 15
- [10-01-0015](#)  
16 Jun O’Hara (Chiba Univ.) Regularization of self-inductance ..... 15

**13:15–14:15 Talk Invited by Topology Section**

10-02-0001

Hokuto Konno (RIKEN) Gauge theory and diffeomorphism and homeomorphism groups

March 18th (Wed)

**10:00–12:00**

10-01-0001

17 Katsumi Ishikawa (Kyoto Univ.) Minimal coloring numbers on minimal diagrams of torus links ..... 10  
Kazuhiro Ichihara (Nihon Univ.)  
Eri Matsudo (Nihon Univ.)

10-01-0003

18 Natsumi Oyamaguchi (Shumei Univ.) Pallets of Dehn  $p$ -coloring for spatial graphs ..... 10  
Kanako Oshiro (Sophia Univ.)

10-01-0007

19 Mario Eudave-Muñoz <sup>b</sup> (Univ. Nacional Autónoma de México) The maximum and minimum genus of a multibranching surface ..... 15  
Makoto Ozawa (Komazawa Univ.)

10-01-0016

20 Noboru Ito (Univ. of Tokyo) The tabulation of prime knot projections with their mirror images up to eight double points ..... 10  
Yusuke Takimura  
(Gakushuin Boys' Junior High School)

10-01-0019

21 Kazuhiro Ichihara (Nihon Univ.) Two-bridge knots admit no purely cosmetic surgeries ..... 15  
Toshio Saito (Joetsu Univ. of Edu.)  
In Dae Jong (Kindai Univ.)  
Thomas W. Mattman  
(California State Univ., Chico)

10-01-0020

22 Yasuharu Nakae (Akita Univ.) Dehn surgeries along genus one fibered knots and left-orderability of fundamental groups ..... 15  
Kazuhiro Ichihara (Nihon Univ.)

10-01-0025

23 Toshifumi Tanaka (Gifu Univ.) On satellite knots with symmetric union presentations ..... 10

10-01-0026

24 Tetsuya Abe (Ritsumeikan Univ.) Table of annulus presentations of knots ..... 10  
Keiji Tagami (Nat. Fisheries Univ.)

10-01-0018

25 Tetsuya Itoh (Kyoto Univ.) Infiniteness of closed braid representatives ..... 10

## Infinite Analysis

March 18th (Wed)

**14:15–16:15**

11-01-0009

- 1 Koichi Hiraide (Ehime Univ.) Stokes-like phenomena which appear in dynamics of complex Henon maps ..... 15  
 Chihiro Matsuoka (Osaka City Univ.)

11-01-0001

- 2 Nozomu Matsuura Explicit formula for planar discrete elasticae ..... 15  
 (Kurume Inst. of Tech.)

11-01-0015

- 3 Yuuki Tadokoro Nonlinear  $O(3)$  sigma model in discrete complex analysis ..... 15  
 (Nat. Inst. of Tech., Kisarazu Coll.)  
 Masayoshi Sekiguchi  
 (Nat. Inst. of Tech., Kisarazu Coll.)  
 Masaru Kamata  
 (Nat. Inst. of Tech., Kisarazu Coll.\*)

11-01-0008

- 4 Yas-Hiro Quano Runge–Lenz like vectors for central force fields ..... 15  
 (Suzuka Univ. of Med. Sci.)

11-01-0018

- 5 Junichi Shiraishi (Univ. of Tokyo) Non-stationary Ruijsenaars function ..... 15

11-01-0019

- 6 Junichi Shiraishi (Univ. of Tokyo) Non-stationary and stationary Ruijsenaars functions and eigenvalue problem associated with Ruijsenaars operator ..... 15

11-01-0012

- 7 Yusuke Ohkubo (Univ. of Tokyo) Non-stationary Ruijsenaars functions and intertwining operators of the  
Jun'ichi Shiraishi (Univ. of Tokyo) Ding–Iohara–Miki algebra ..... 15  
 Masayuki Fukuda (Univ. of Tokyo)

**16:30–17:30 Talk Invited by Infinite Analysis Special Session**

11-02-0002

- Hideya Watanabe (Kyoto Univ.)  $q$ quantizations

March 19th (Thu)

**9:45–11:30**

11-01-0014

- 8 Sanefumi Moriyama (Osaka City Univ.) Quantum curves and Weyl groups ..... 15

11-01-0017

- 9 Kanehisa Takasaki (Kindai Univ.) Equivariant Gromov–Witten theory of  $CP^1$  and equivariant Toda hierarchy ..... 15

11-01-0006

- 10 Hiroyuki Yamane (Univ. of Toyama) On typical irreducible characters of generalized quantum groups ..... 15

11-01-0004

- 11 Ryo Fujita (Kyoto Univ.) Singularities of normalized  $R$ -matrices between fundamental modules over the affine quantum groups of type  $ADE$  ..... 15

11-01-0002

- 12 Yasuaki Gyoda (Nagoya Univ.) Relation between  $f$ -vectors and  $d$ -vectors in cluster algebras of finite type or rank 2 ..... 15

11-01-0016

- 13 Naoto Okubo (Aoyama Gakuin Univ.) Cluster algebras and higher order  $q$ -Painlevé systems of type  $A_7^{(1)}$  ..... 15  
 Tetsu Masuda (Aoyama Gakuin Univ.)  
 Teruhisa Tsuda (Hitotsubashi Univ.)

**14:15–16:00**

11-01-0003

14 Genki Shibukawa (Kobe Univ.) Another proof of difference equations for interpolation Jack polynomials  
 ..... 15

11-01-0007

15 Ryuya Matsunawa (Chuo Univ.) Variants of confluent  $q$ -hypergeometric equations ..... 15  
 Tomoki Sato (Chuo Univ.)  
 Kouichi Takemura (Ochanomizu Univ.)

11-01-0010

16 Hiroshi Kawakami On four-dimensional Painlevé-type difference equations ..... 15  
 (Aoyama Gakuin Univ.)

11-01-0011

17 Hiroshi Kawakami A  $q$ -analogue of the matrix sixth Painlevé system ..... 15  
 (Aoyama Gakuin Univ.)

11-01-0013

18 Masahiko Ito (Univ. of Ryukyus)  $q$ -Difference system for the elliptic hypergeometric integral of type  $G_2$   
 Masatoshi Noumi (Kobe Univ.) with six parameters ..... 15

11-01-0005

19 Hidehito Nagao (Akashi Coll. of Tech.) Padé method and  $q$ -quadratic Garnier systems ..... 15  
 Yasuhiko Yamada (Kobe Univ.)

**16:15–17:15 Talk Invited by Infinite Analysis Special Session**

11-02-0001

Yoshihisa Saito (Rikkyo Univ.) On elliptic Artin groups