

## 2021 The Mathematical Society of Japan

**ANNUAL MEETING**

Dates: March 15th (Mon)–18th (Thu), 2021

Venue: Yagami Campus, Keio University  
and Live streamingContact to: E-mail [keio21mar@mathsoc.jp](mailto:keio21mar@mathsoc.jp)

The Mathematical Society of Japan

	I	II	III	IV	V	VI	VII	VIII	IX	
15th (Mon)	Found. of Math. & Hist. of Math. 9:30–10:35 14:15–15:15	Algebra 9:40–10:45 14:15–16:30	Geometry 9:30–12:00 14:15–15:15	Complex Analysis 15:30–16:40	Functional Equations 9:00–12:00 14:15–15:30		Statistics and Probability 10:00–12:00		Topology 10:00–11:00	
	Featured Invited Talks					13:00–14:00				
	Invited Talk 10:45–11:45	Invited Talk 11:00–12:00	Invited Talk 15:30–16:30	Invited Talks 11:00–12:00 14:15–15:15	Invited Talk 15:40–16:40		Invited Talks 14:15–15:15 15:35–16:35		Invited Talk 14:15–15:15	
16th (Tue)	Found. of Math. & Hist. of Math. 10:15–11:00	Algebra 10:00–12:00  Invited Talk 13:00–14:00	Geometry  Invited Talks 10:30–11:30 13:00–14:00	Complex Analysis 13:00–14:10 Invited Talk 11:00–12:00	Functional Equations 9:00–12:00 Invited Talk 13:00–14:00	Functional Analysis 9:00–10:30 Invited Talks 11:00–12:00 13:00–14:00		Applied Mathematics 9:30–10:45 Invited Talk 11:00–12:00	Topology 10:00–11:00 Invited Talk 13:15–14:15	
	MSJ Prizes Presentation (Multimedia Room) . . . . . (14:30–15:00)									
	Plenary Talks (Multimedia Room) . . . . . (15:15–16:15)					Spring Prize Winner . . . . . (15:15–16:15) Shigeru Mukai (Kyoto Univ.) . . . . . (16:30–17:30)				
17th (Wed)	Infinite Analysis 10:30–12:00 14:15–15:15	Algebra 9:30–12:00	Geometry 10:00–12:00 14:15–15:15	Real Analysis 10:30–11:50	Functional Equations 9:00–12:00 14:15–15:30	Functional Analysis 9:00–10:45	Statistics and Probability 10:00–10:35 14:15–15:00	Applied Mathematics 9:40–10:45 14:15–15:20		
	Featured Invited Talks					13:00–14:00				
		Invited Talks 14:15–15:15 15:30–16:30	Invited Talk 15:30–16:30	Invited Talk 14:30–15:30	Invited Talk 15:40–16:40	Invited Talks 11:00–12:00 14:30–15:30	Invited Talks 10:55–11:55 15:20–16:20	Invited Talk 11:00–12:00		
18th (Thu)	Infinite Analysis	Algebra 9:40–12:00 14:15–16:25		Real Analysis 10:00–11:45 14:15–14:45	Functional Equations 9:00–12:00 14:15–15:30			Applied Mathematics 9:40–10:45 14:15–15:05		
	Featured Invited Talks					13:00–14:00				
	Invited Talks 10:00–11:00 11:15–12:15			Invited Talk 15:00–16:00	Invited Talk 15:40–16:40			Invited Talk 11:00–12:00		

## Plenary Talks

March 16th (Tue) Live streaming from Multimedia Room

Spring Prize Winner	<sup>Z</sup> .....	(15:15–16:15)
Shigeru Mukai (Kyoto Univ.)	<sup>Z</sup> Algebraic varieties and their symmetry with emphasis on K3 surfaces and their companions .....	(16:30–17:30)

## Featured Invited Talks

March 15th (Mon)

### Conference Room II

Hiroshi Fujita (Ehime Univ.)	<sup>Z</sup> Transfinite ordinals and the continuum problem .....	(13:00–14:00)
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### Conference Room V

Guest Talk from the Japan Society for Industrial and Applied Mathematics

Kazue Sako (Waseda Univ.)	<sup>Z</sup> Cryptographic protocols brings transparency to digital process .....	(13:00–14:00)
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### Conference Room VII

Katsuhiko Kuribayashi (Shinshu Univ.)	<sup>Z</sup> Derived string topology —Toward a two dimensional open-closed topological quantum field theory for classifying spaces— .....	(13:00–14:00)
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March 17th (Wed)

### Conference Room II

Shu Kawaguchi (Doshisha Univ.)	<sup>Z</sup> Height functions in arithmetic dynamics .....	(13:00–14:00)
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### Conference Room VII

Kenichi Mitani (Okayama Pref. Univ.)	<sup>Z</sup> Geometrical constants of Banach spaces .....	(13:00–14:00)
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March 18th (Thu)

### Conference Room II

Tomoki Nakanishi (Nagoya Univ.)	<sup>Z</sup> Cluster algebras, root systems, and scattering diagrams ...	(13:00–14:00)
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### Conference Room V

Yoshihisa Morita (Ryukoku Univ.)	<sup>Z</sup> Reaction-diffusion systems and pattern formations —Emerging structure of solutions under constraint— .....	(13:00–14:00)
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## Talks Invited by Research Sections and Special Session

March 15th (Mon)

### Foundation of Mathematics and History of Mathematics (Conference Room I)

Takahiro Seki (Niigata Univ.)<sup>Z</sup> Substructural logics from the viewpoint of relevant logics · (10:45–11:45)

### Algebra (Conference Room II)

Naoki Chigira (Kumamoto Univ.)<sup>Z</sup> Sporadic simple groups and combinatorial structure ····· (11:00–12:00)

### Geometry (Conference Room III)

Hisashi Naito (Nagoya Univ.)<sup>Z</sup> Trivalent discrete surfaces and carbon structures ····· (15:30–16:30)

### Complex Analysis (Conference Room IV)

Tetsu Shimomura (Hiroshima Univ.)<sup>Z</sup> Sobolev's inequality on Musielak–Orlicz–Morrey spaces ··· (11:00–12:00)

### Award Lecture for the 2020 MSJ Analysis Prize

Hideki Miyachi (Kanazawa Univ.)<sup>Z</sup> Complex analysis on Teichmüller space ····· (14:15–15:15)

### Functional Equations (Conference Room V)

Akihito Ebisu (Chiba Inst. of Tech.)<sup>Z</sup> Hypergeometric functions and difference equations ····· (15:40–16:40)

### Statistics and Probability (Conference Room VII)

Dai Taguchi (Okayama Univ.)<sup>Z</sup> Numerical analysis of stochastic differential equations ····· (14:15–15:15)

Benoît Collins (Kyoto Univ.)<sup>Z</sup> On the operator norm of random matrices ····· (15:35–16:35)

### Topology (Conference Room IX)

Hokuto Konno (Univ. of Tokyo)<sup>Z</sup> Gauge theory and diffeomorphism and homeomorphism groups  
······ (14:15–15:15)

March 16th (Tue)

### Algebra (Conference Room II)

Hiroyuki Nakaoka (Nagoya Univ.)<sup>Z</sup> External triangulation of the homotopy category of exact  
quasi-category ····· (13:00–14:00)

### Geometry (Conference Room III)

Ryosuke Takahashi (Kyushu Univ.)<sup>Z</sup> Some geometric flow approaches for deformed Hermitian–  
Yang–Mills equation ····· (10:30–11:30)

Yosuke Kubota<sup>Z</sup> Higher index theory in geometry and physics ····· (13:00–14:00)  
(Shinshu Univ./RIKEN)

### Complex Analysis (Conference Room IV)

Yuta Kusakabe (Kyoto Univ.)<sup>Z</sup> Oka manifolds and ellipticity ····· (11:00–12:00)

### Functional Equations (Conference Room V)

Norisuke Ioku (Tohoku Univ.)<sup>Z</sup> The best constant of the Sobolev type inequality ····· (13:00–14:00)

### Functional Analysis (Conference Room VI)

Takuya Mine (Kyoto Inst. Tech.)<sup>Z</sup> Schrödinger operators with point interactions ····· (11:00–12:00)

Toshiyuki Kobayashi (Univ. of Tokyo)<sup>Z</sup> Tempered homogeneous spaces ····· (13:00–14:00)

**Applied Mathematics** (Conference Room VIII)

- Yoshio Sano (Univ. of Tsukuba)<sup>Z</sup> Matroidal structures on partially ordered sets and related topics ..... (11:00–12:00)

**Topology** (Conference Room IX)

- Naoki Fujita (Univ. of Tokyo)<sup>Z</sup> Newton–Okounkov bodies arising from cluster structures and associated toric degenerations ..... (13:15–14:15)

March 17th (Wed)

**Algebra** (Conference Room II)

Award Lecture for the 2021 MSJ Algebra Prize

- Kazuhiko Yamaki (Kyoto Univ.)<sup>Z</sup> Progress in the geometric Bogomolov conjecture ..... (14:15–15:15)

Award Lecture for the 2021 MSJ Algebra Prize

- Masanori Asakura (Hokkaido Univ.)<sup>Z</sup> Regulators and special values of  $L$ -functions ..... (15:30–16:30)

**Geometry** (Conference Room III)

- Yohei Sakurai (Tohoku Univ.)<sup>Z</sup> Recent development of geometric analysis on weighted Ricci curvature ..... (15:30–16:30)

**Functional Equations** (Conference Room V)

Award Lecture for the 2020 MSJ Analysis Prize

- Hirokazu Ninomiya (Meiji Univ.)<sup>Z</sup> The world of reaction-diffusion systems ..... (15:40–16:40)

**Real Analysis** (Conference Room IV)

- Koji Aoyama (Chiba Univ.)<sup>Z</sup> Strongly quasinonexpansive mappings and strongly quasinonexpansive sequences of mappings ..... (14:30–15:30)

**Functional Analysis** (Conference Room VI)

Award Lecture for the 2020 MSJ Analysis Prize

- Kengo Matsumoto<sup>Z</sup> Continuous orbit equivalence, topological conjugacy of symbolic dynamical systems and  $C^*$ -algebras ..... (11:00–12:00)  
(Joetsu Univ. of Edu.)

- Norio Nawata (Osaka Univ.)<sup>Z</sup> Simple stably projectionless  $C^*$ -algebras ..... (14:30–15:30)

**Statistics and Probability** (Conference Room VII)

- Shoko Chisaki (Osaka Inst. of Tech.)<sup>Z</sup> Design of experiments and their application to deep learning ..... (10:55–11:55)

- Rie Enomoto (Seikei Univ.)<sup>Z</sup> Consistency properties of some information criteria in the growth curve model under a high-dimensional framework .. (15:20–16:20)

**Applied Mathematics** (Conference Room VIII)

- Kohei Nakajima (Univ. of Tokyo)<sup>Z</sup> Physical reservoir computing: pursuing the nature of information processing ..... (11:00–12:00)

March 18th (Thu)

**Functional Equations** (Conference Room V)

- Takahiro Okabe (Osaka Univ.)<sup>Z</sup> Asymptotic analysis of the solution to the Navier–Stokes equations by external forces ..... (15:40–16:40)



## Open Lectures for Citizens

Date: March 14th (Sun) 14:00–15:10

Venue: Live streaming

Sponsored by: The Mathematical Society of Japan

Co-sponsored by: Department of Mathematics,  
Faculty of Science and Technology, Keio University

Program: Opening Speech ..... (14:00–14:10)  
Tomohide Terasoma (President of MSJ/Hosei Univ.)

Lecture 1: “From Worldly Philosophy to Probability Theory” ..... (14:10–15:10)  
Keisuke Hara (Mynd, Inc.)

Web Page: <https://www.mathsoc.jp/en/meeting/keio21mar/>

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# Algebra

March 15th (Mon)      Conference Room II

## 9:40–10:45

- 1 Mawo Ito (Kyoto Univ.)<sup>Z</sup> A product-type generating function for plane partitions derived from  
Shuhei Kamioka (Kyoto Univ.) the Askey–Wilson polynomials ..... 10
- 2 Ryotaro Koshio (Tokyo Univ. of Sci.)<sup>Z</sup> On induced modules of support  $\tau$ -tilting modules over group algebras  
Yuta Kozakai (Tokyo Univ. of Sci.) ..... 10
- 3 Kenichiro Tanabe (Hokkaido Univ.)<sup>Z</sup> The weak modules for the fixed point subalgebra of the vertex algebra  
associated to a non-degenerate even lattice ..... 15
- 4 Shoma Sugimoto (Kyoto Univ.)<sup>Z</sup> On the logarithmic  $W$ -algebras ..... 15
- 5 Yasuhiro Omoda (Akashi Coll. of Tech.) Thick representations and tensor products ..... \*  
Kazunori Nakamoto  
(Univ. of Yamanashi)
- 6 Shotaro Kawata (Kobe Univ.) Higher Capelli elements for classical Lie algebras ..... \*
- 7 Toshiya Yurikusa (Tohoku Univ.) Tame algebras have dense  $g$ -vector fans ..... \*

## 11:00–12:00 Talk Invited by Algebra Section

Naoki Chigira (Kumamoto Univ.)<sup>Z</sup> Sporadic simple groups and combinatorial structure

## 14:15–16:30

- 8 Yoshiharu Shibata (Yamaguchi Univ.)<sup>Z</sup> On lifting modules which do not satisfy the finite internal exchange  
property ..... 10
- 9 Tsutomu Nakamura (Univ. of Tokyo)<sup>Z</sup> Structure of flat cotorsion modules over noetherian algebras and ele-  
Ryo Kanda (Osaka City Univ.) mentary duality on Ziegler spectra ..... 15
- 10 Ryo Kanda (Osaka City Univ.)<sup>Z</sup> Extension groups between atoms in abelian categories ..... 15
- 11 Ayako Itaba (Tokyo Univ. of Sci.)<sup>Z</sup> Characterization of the quantum projective planes finite over their  
Izuru Mori (Shizuoka Univ.) centers ..... 15
- 12 Haigang Hu (Shizuoka Univ.)<sup>Z</sup> Noncommutative conics in Calabi–Yau quantum projective planes ..... 15  
Masaki Matsuno (Shizuoka Univ.)  
Izuru Mori (Shizuoka Univ.)
- 13 Maiko Ono (Okayama Univ. of Sci.)<sup>Z</sup> On the weak lifting property of DG modules with the use of  $j$ -operators  
Saeed Nasseh (Georgia Southern Univ.) ..... 15  
Yuji Yoshino (Okayama Univ.)
- 14 Akihiro Higashitani (Osaka Univ.)<sup>Z</sup> Conic divisorial ideals and non-commutative crepant resolutions of edge  
Koji Matsushita (Osaka Univ.) rings of complete multipartite graphs ..... 15
- 15 Akihiro Higashitani (Osaka Univ.)<sup>Z</sup> Block diagonal matching field ideals and toric degenerations of Grass-  
Hidefumi Ohsugi mannians ..... 15  
(Kwansei Gakuin Univ.)
- 16 Yoshitomo Baba (Osaka Kyoiku Univ.) On matrix representation of two-sided Harada rings ..... \*



- 17 Takeshi Yoshizawa (Toyota Nat. Coll. of Tech.) Melkersson conditions for extension subcategories ..... \*
- 18 Shinnosuke Ishiro (Nihon Univ.) Another proof of the almost purity theorem by normalized length ..... \*  
Kazuma Shimomoto (Nihon Univ.)

March 16th (Tue) Conference Room II

**10:00–12:00**

- 19 Shuhei Tsujie (Hokkaido Univ. of Edu.)<sup>Z</sup> Deformation preserving freeness from the Shi arrangement to the Ish  
Takuro Abe (Kyushu Univ.) arrangement, and its generalization. .... 15  
Tan Nhat Tran (Hokkaido Univ.)
- 20 Kenta Mori (Kwansei Gakuin Univ.)<sup>Z</sup> Edge rings with  $q$ -linear resolutions ..... 10  
Hidefumi Ohsugi  
(Kwansei Gakuin Univ.)  
Akiyoshi Tsuchiya (Univ. of Tokyo)
- 21 Akiko Yazawa (Shinshu Univ.)<sup>Z</sup> On Artinian Gorenstein algebras associated to the face posets of regular  
polyhedra ..... 15
- 22 Kosuke Shibata (Okayama Univ.)<sup>Z</sup> The  $CM_t$  property of general monomial ideals ..... 10  
Naoki Terai (Okayama Univ.)
- 23 Olgur Celikbas (West Virginia Univ.)<sup>Z</sup> On a depth inequality and the second rigidity theorem ..... 15  
Uyen Le (West Virginia Univ.)  
Hiroki Matsui (Univ. of Tokyo)
- 24 Shinya Kumashiro (Chiba Univ.)<sup>Z</sup> Hilbert function of ideals of reduction number two ..... 15
- 25 Ken-ichi Yoshida (Nihon Univ.)<sup>Z</sup> Two different normal reduction numbers ..... 10  
Tomohiro Okuma (Yamagata Univ.)  
Kei-ichi Watanabe (Nihon Univ.)
- 26 Ken-ichi Yoshida (Nihon Univ.)<sup>Z</sup> Strongly elliptic ideal ..... 10  
Tomohiro Okuma (Yamagata Univ.)  
Kei-ichi Watanabe (Nihon Univ.)

**13:00–14:00 Talk Invited by Algebra Section**

- Hiroyuki Nakaoka (Nagoya Univ.)<sup>Z</sup> External triangulation of the homotopy category of exact quasi-category

March 17th (Wed) Conference Room II

**9:30–12:00**

- 27 Kotaro Kawatani (Yamato Univ./Osaka Pref. Univ.)<sup>Z</sup> Stability conditions on affine Noetherian schemes ..... 15
- 28 Ryota Mikami (Kyoto Univ.)<sup>Z</sup> A tropical analog of the Hodge conjecture for smooth complex algebraic  
varieties ..... 15
- 29 Kazuki Yamada (Keio Univ.)<sup>Z</sup>  $p$ -adic Hodge cohomology with syntomic coefficients ..... 10
- 30 Yuki Mizuno (Waseda Univ.)<sup>Z</sup> Classifying the irreducible components of moduli stacks of torsion free  
sheaves on K3 surfaces and an application to Brill–Noether theory ... 15

- 31 Shingo Yashiro (Japan Univ. of Econ.)<sup>Z</sup> ACM line bundles on Del Pezzo surfaces ..... 15
- 32 Norihiko Minami (Nagoya Inst. of Tech.)<sup>Z</sup> Toward a nef-like sufficient criterion for the hierarchy structure which is stronger than: higher uniruledness = lower unirationality ..... 15
- 33 Norihiko Minami (Nagoya Inst. of Tech.)<sup>Z</sup> On the nonexistence of the hierarchy structure: lower stable rationality = higher stable ruledness, for very general hypersurfaces ..... 15
- 34 Ryo Okawa (Kobe Univ.)<sup>Z</sup> Residue formula for integrations over Grassmann manifolds ..... 15
- 35 Makoto Sakurai (Kaichi Gakuen)<sup>Z</sup> Topological chiral conformal algebras related to Batalin–Vilkovisky algebras ..... 15
- 36 Yuji Sano (Fukuoka Univ.) Chern characters of toric Fano varieties ..... \*
- Hiroshi Sato (Fukuoka Univ.)
- Yusuke Suyama (Osaka Univ.)
- 37 Toru Tsukioka (Tokai Univ.) Examples of weak Fano manifolds with small contractions ..... \*
- 38 Taku Suzuki (Utsunomiya Univ.) Generalized Mukai conjecture for Fano 6-folds ..... \*
- 39 Tomohiro Iwami (Kyushu Inst. of Tech.) Periodically Higgs sheaves on an extended extremal neighborhood and the related Miyaoka–Yau type inequality with the associated 3rd Chern classes ..... \*
- 40 Ai Takahashi (Tokyo Metro. Univ.) Representations of divisors on hyperelliptic curves and Gröbner basis ..... \*
- Hiro-o Tokunaga (Tokyo Metro. Univ.)
- 41 Tetsuya Ando (Chiba Univ.) Extremal cubic homogeneous inequalities of three variables ..... \*
- 14:15–15:15 Award Lecture for the 2021 MSJ Algebra Prize**
- Kazuhiko Yamaki (Kyoto Univ.)<sup>Z</sup> Progress in the geometric Bogomolov conjecture
- 15:30–16:30 Award Lecture for the 2021 MSJ Algebra Prize**
- Masanori Asakura (Hokkaido Univ.)<sup>Z</sup> Regulators and special values of  $L$ -functions

March 18th (Thu) Conference Room II

**9:40–12:00**

- 42 Satoshi Kumabe (Kyushu Univ.)<sup>Z</sup> Dwork hypersurfaces of degree six and Greene’s hypergeometric function ..... 15
- 43 Kazuhiro Ito (Kyoto Univ.)<sup>Z</sup> Uniform local constancy of étale cohomology of rigid analytic varieties ..... 15
- 44 Ippei Nagamachi (Univ. of Tokyo)<sup>Z</sup> The Shafarevich conjecture for proper hyperbolic polycurves ..... 15
- 45 Ryutaro Sekigawa (Tokyo Univ. of Sci.)<sup>Z</sup> Relative power integral bases for Rikuna’s generic cyclic polynomial of odd prime degree ..... 15
- 46 Toru Komatsu (Tokyo Univ. of Sci.)<sup>Z</sup> On the exponent of the ideal class groups of imaginary multiquadratic fields ..... 10
- 47 Kazuaki Murakami (Keio Girls Senior High School)<sup>Z</sup> Weak Greenberg’s generalized conjecture for imaginary quadratic fields ..... 10
- 48 Takenori Kataoka (Keio Univ.)<sup>Z</sup> Fitting ideals in two-variable equivariant Iwasawa theory and an application to CM elliptic curves ..... 10

49	Takenori Kataoka (Keio Univ.) <sup>Z</sup>	Stark systems and equivariant main conjectures . . . . .	10
50	Hideki Matsumura (Keio Univ.) <sup>Z</sup>	Infinitely many hyperelliptic curves with exactly two rational points . . . . .	10
51	Hideki Matsumura (Keio Univ.) <sup>Z</sup>	A unique pair of triangles . . . . .	10
52	Masakazu Yamagishi (Nagoya Inst. of Tech.)	On rational formal groups . . . . .	*
53	Masakazu Yamagishi (Nagoya Inst. of Tech.)	Formal weight enumerators and Chebyshev polynomials . . . . .	*
54	Abdelaziz El Habibi (Mohammed First Univ.) <u>Yasushi Mizusawa</u> (Nagoya Inst. of Tech.)	On pro- $p$ -extensions of a number field which are tamely ramified over an intermediate $\mathbb{Z}_p$ -extension . . . . .	*
55	<u>Ryoto Tange</u> (Waseda Univ.) Jun Ueki (Tokyo Denki Univ.)	On the Iwasawa $\lambda$ -invariants of twisted knot modules for holonomy representations of 2-bridge knots . . . . .	*
<b>14:15–16:25</b>			
56	<u>Iwao Kimura</u> (Univ. of Toyama) <sup>Z</sup> Yoshifumi Tomioka (Univ. of Toyama)	On an asymptotic behaviour of relative class numbers of imaginary Abelian function fields . . . . .	15
57	Daisuke Shiomi (Yamagata Univ.) <sup>Z</sup>	A construction of cyclotomic function fields whose zeta polynomials have a given irreducible factor. . . . .	10
58	Masatoshi Suzuki (Tokyo Tech) <sup>Z</sup>	Canonical systems arising from $L$ -functions . . . . .	15
59	Kota Saito (Nagoya Univ.) <sup>Z</sup>	Linear equations with two variables in Piatetski–Shapiro sequence . . . .	15
60	Kota Saito (Nagoya Univ.) <sup>Z</sup> <u>Yuuya Yoshida</u> (Nagoya Univ.)	Distributions of finite sequences represented by polynomials and Hardy fields . . . . .	15
61	<u>Hajime Kaneko</u> (Univ. of Tsukuba) <sup>Z</sup> Thomas Stoll (Univ. of Lorraine)	Products of integers with few nonzero digits in binary expansion . . . .	15
62	Genki Shibukawa (Kobe Univ.) <sup>Z</sup>	An equivalent condition for the Markov triples and the Diophantine equation $a^2 + b^2 + c^2 = abc f(a, b, c)$ . . . . .	10
63	Shigeru Iitaka (Gakushuin Univ.) <sup>Z</sup>	On hyperperfect numbers of hybrid type . . . . .	15
64	<u>Takeshi Kurosawa</u> (Tokyo Univ. of Sci.) Daniel Duverney (Baggio Eng. School) Iekata Shiokawa (Keio Univ.) <sup>*</sup>	Transcendence of numbers involving Cahen’s constant . . . . .	*
65	<u>Shin-ya Koyama</u> (Toyo Univ.) Nobushige Kurokawa (Tokyo Tech) <sup>*</sup>	Functional equations for Selberg zeta functions with Tate motives . . . .	*
66	Hidenori Tanaka (Toyo Univ.)	The Euler product expressions of the absolute tensor products of the Dirichlet $L$ -functions . . . . .	*
67	Masatoshi Nakano (Kesennuma Coll. of Tech.)	Some conjectures on the divisor function . . . . .	*
68	Miyu Nakano (Yamaguchi Univ.) Tadaaki Igawa <u>Makoto Minamide</u> (Yamaguchi Univ.)	On an error term for the mean square of $\delta_k(n)$ . . . . .	*

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- 17 Masahiro Morimoto (Osaka City Univ.) On weakly reflective submanifolds in compact isotropy irreducible Riemannian homogeneous spaces ..... \*

**15:30–16:30 Talk Invited by Geometry Section**

Hisashi Naito (Nagoya Univ.)<sup>Z</sup> Trivalent discrete surfaces and carbon structures

March 16th (Tue) Conference Room III

**10:30–11:30 Talk Invited by Geometry Section**

Ryosuke Takahashi (Kyushu Univ.)<sup>Z</sup> Some geometric flow approaches for deformed Hermitian–Yang–Mills equation

**13:00–14:00 Talk Invited by Geometry Section**

Yosuke Kubota<sup>Z</sup> Higher index theory in geometry and physics  
(Shinshu Univ./RIKEN)

March 17th (Wed) Conference Room III

**10:00–12:00**

- 18 Yoshinori Hashimoto (Tokyo Tech)<sup>Z</sup> Expected centre of mass of the random Kodaira embedding ..... 15
- 19 Shinichiro Kobayashi (Tohoku Univ.)<sup>Z</sup> A universal inequality for Laplace eigenvalues of arc-transitive graphs ..... 15
- 20 Jesus A. Álvarez López<sup>Z</sup> From hyperbolic surfaces to chaotic Delone sets ..... 15  
(Univ. of Santiago de Compostela)  
Ramón Barral Lijó (Ritsumeikan Univ.)  
John Hunton (Durham Univ.)  
Hiraku Nozawa (Ritsumeikan Univ.)  
John R. Parker (Durham Univ.)
- 21 Jesus A. Álvarez López<sup>Z</sup> Symmetry-breaking of the large-scale geometry of graphs ..... 15  
(Univ. of Santiago de Compostela)  
Ramón Barral Lijó (Ritsumeikan Univ.)  
Hiraku Nozawa (Ritsumeikan Univ.)
- 22 Daisuke Kazukawa (Osaka Univ.)<sup>Z</sup> Convergence of metric transformed spaces ..... 15
- 23 Yoshito Ishiki (Univ. of Tsukuba)<sup>Z</sup> An embedding, an extension, and an interpolation of ultrametrics ..... 15
- 24 Masayuki Igarashi (Tokyo Univ. of Sci.) On a one-parameter deformation of the metrics which are constituents of the Hermite–Liouville structures on Hopf surface and the property that these metrics are non-isometric each other ..... \*
- 25 Saburo Saitoh Division by zero calculus and Euclidean geometry—Revolution in Euclidean geometry— ..... \*  
(Gunma Univ./Inst. of Reproducing Kernels)  
Hiroshi Okumura
- 14:15–15:15**
- 26 Tadashi Fujioka (Kyoto Univ.)<sup>Z</sup> Serre fibration structure of collapsing Alexandrov spaces ..... 15
- 27 Yuya Kodama (Tokyo Metro. Univ.)<sup>Z</sup> Divergence function of the braided Thompson group ..... 15
- 28 Tomoshige Yukita (Waseda Univ.)<sup>Z</sup> Continuity of the growth rates of Coxeter groups ..... 15

**15:30–16:30 Talk Invited by Geometry Section**Yohei Sakurai (Tohoku Univ.)<sup>Z</sup> Recent development of geometric analysis on weighted Ricci curvature

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**Complex Analysis**

March 15th (Mon) Conference Room IV

**11:00–12:00 Talk Invited by Complex Analysis Section**Tetsu Shimomura (Hiroshima Univ.)<sup>Z</sup> Sobolev's inequality on Musielak–Orlicz–Morrey spaces**14:15–15:15 Award Lecture for the 2020 MSJ Analysis Prize**Hideki Miyachi (Kanazawa Univ.)<sup>Z</sup> Complex analysis on Teichmüller space**15:30–16:40**

- 1 Yôsuke Hishikawa (Gifu Univ.)<sup>Z</sup> Function spaces induced by two parabolic Bloch spaces ..... 15  
Masaharu Nishio (Osaka City Univ.)  
Katsunori Shimomura (Ibaraki Univ.)  
Masahiro Yamada (Gifu Univ.)
- 2 Kentarou Itou (Osaka City Univ.)<sup>Z</sup> Lagrange interpolation for Laguerre-type weights ..... 15  
Ryozi Sakai (Meijo Univ.)
- 3 Katsuhiko Matsuzaki (Waseda Univ.)<sup>Z</sup> Beurling–Ahlfors extension by heat kernel,  $A_\infty$ -weights for VMO, and  
Huaying Wei (Jiangsu Normal Univ.) vanishing Carleson measures ..... 15
- 4 Tomoshige Yukita (Waseda Univ.)<sup>Z</sup> Locally rigid hyperbolic reflection groups of infinite covolume in dimension 5 ..... 15
- 5 Fumi-Yuki Maeda (Hiroshima Univ.)<sup>\*</sup> Trudinger's inequality for double phase functionals with variable exponents ..... \*  
Yoshihiro Mizuta (Hiroshima Univ.)<sup>\*</sup>  
Takao Ohno (Oita Univ.)  
Tetsu Shimomura (Hiroshima Univ.)
- 6 Michio Seto An indefinite Schwarz–Pick inequality on the bidisk ..... \*  
(Nat. Defense Acad. of Japan)
- 7 Shunji Horiguchi Extended Mandelbrot sets ..... \*
- 8 Masashi Kisaka (Kyoto Univ.) Commuting entire functions with a common fixed point ..... \*

March 16th (Tue) Conference Room IV

**11:00–12:00 Talk Invited by Complex Analysis Section**Yuta Kusakabe (Kyoto Univ.)<sup>Z</sup> Oka manifolds and ellipticity

**13:00–14:10**

- 9 Takanori Ayano (Osaka City Univ.)<sup>Z</sup> Relationships between Abelian functions of genus 2 and elliptic functions ..... 15  
Victor M. Buchstaber  
(Steklov Inst. of Math.)
- 10 Takayuki Koike (Osaka City Univ.)<sup>Z</sup> Linearization of transition functions of a semi-positive line bundle along a certain submanifold ..... 15
- 11 Masanori Adachi (Shizuoka Univ.)<sup>Z</sup> On Levi flat hypersurfaces with transversely affine foliation ..... 15  
Séverine Biard  
(Univ. Polytechnique Hauts-de-France)
- 12 Takeo Ohsawa (Nagoya Univ.)<sup>Z</sup> Variants of Hörmander’s theorem on  $q$ -convex manifolds by a technique of infinitely many weights ..... 15
- 13 Masataka Iwai (Osaka City Univ.) On projective manifolds whose tangent bundles contain positive sub-bundles ..... \*
- 14 Makoto Abe (Hiroshima Univ.) A generalization of a theorem of Kühnel on globally defined analytic sets ..... \*  
Tadashi Shima (Hiroshima Univ.)  
Shun Sugiyama  
(NEC Comm. Systems, Ltd.)
- 15 Katsusuke Nabeshima Computing  $\kappa$ -invariants of isolated hypersurface singularities ..... \*  
(Univ. of Tokushima)  
Shinichi Tajima (Niigata Univ.\*)
- 16 Shinichi Tajima (Niigata Univ.\*) Logarithmic vector fields along singular plane curves and Camacho–Sad–Suwa indices ..... \*  
Katsusuke Nabeshima  
(Univ. of Tokushima)
- 17 Hidetaka Hamada A boundary Schwarz lemma for mappings from the unit polydisc to irreducible bounded symmetric domains ..... \*  
(Kyushu Sangyo Univ.)  
Gabriela Kohr (Babeş-Bolyai Univ.)

**Functional Equations**

March 15th (Mon) Conference Room V

**9:00–12:00**

- 1 Masakazu Onitsuka <sup>Z</sup> Rectifiability and attractivity for two-dimensional nonautonomous differential systems ..... 15  
(Okayama Univ. of Sci.)  
Satoshi Tanaka (Tohoku Univ.)
- 2 Satoshi Tanaka (Tohoku Univ.)<sup>Z</sup> On a perturbation theory for the planar quasilinear differential system and its application ..... 15  
Masakazu Onitsuka  
(Okayama Univ. of Sci.)  
Kenta Itakura  
(Matsue Yamamoto Metal Co. Ltd.)
- 3 Sohei Ashida (Gakushuin Univ.)<sup>Z</sup> Structures of the sets of critical values less than the first energy threshold and associated critical points of the Hartree–Fock functional ..... 15

## 15 Functional Equations

- 4 Haruya Mizutani (Osaka Univ.)<sup>Z</sup> Scattering theory for wave equations with singular potentials . . . . . 15
- 5 Takanobu Hara (Hokkaido Univ.)<sup>Z</sup> Trace inequalities of the Sobolev type and nonlinear Dirichlet problems  
. . . . . 10
- 6 Takeshi Suguro (Tohoku Univ.)<sup>Z</sup> Shannon’s inequality for a generalized entropy and an application to  
the uncertainty principle . . . . . 15
- 7 Naoki Hamamoto (Osaka City Univ.)<sup>Z</sup> Non-attainability of the best constant in weighted Hardy inequality for  
solenoidal fields . . . . . 12
- 8 Kensuke Yoshizawa (Tohoku Univ.)<sup>Z</sup> Existence and non-existence of elastic graphs with the symmetric cone  
obstacle . . . . . 15
- 9 Kousuke Kuto (Waseda Univ.)<sup>Z</sup> Full cross-diffusion limit in the stationary Shigesada–Kawasaki–Teramoto  
model . . . . . 15
- 10 Yasuhito Miyamoto (Univ. of Tokyo)<sup>Z</sup> Existence and uniqueness of singular solutions for supercritical semilin-  
Yūki Naito (Hiroshima Univ.) ear elliptic equations . . . . . 10
- 14:15–15:30**
- 11 Tomoyuki Oka (Tohoku Univ.)<sup>Z</sup> Qualitative space-time homogenization for the porous medium equation  
Goro Akagi (Tohoku Univ.) . . . . . 15
- 12 Tomoyuki Oka (Tohoku Univ.)<sup>Z</sup> Corrector results for space-time homogenization of nonlinear diffusion  
Goro Akagi (Tohoku Univ.) . . . . . 10
- 13 Putri Zahra Kamalia (Tohoku Univ.)<sup>Z</sup> Patterns with prescribed numbers of critical points on topological tori  
Shigeru Sakaguchi (Tohoku Univ.) . . . . . 15
- 14 Takashi Suzuki (Osaka Univ.)<sup>Z</sup> Gradient inequality and convergence of normalized Ricci flow . . . . . 5
- 15 Ryuji Kajikiya (Saga Univ.) Existence of nodal solutions for the sublinear Moore–Nehari equation  
. . . . . \*
- 16 Tetsutaro Shibata (Hiroshima Univ.) Precise asymptotics for bifurcation curve of nonlinear ordinary differ-  
ential equation . . . . . \*
- 17 Ichiro Tsukamoto (Toyo Univ.) On the boundary value problem of  $x'' = -t^{\alpha\lambda-2}x^{1+\alpha}$  . . . . . \*
- 18 Hidetoshi Tahara (Sophia Univ.\*) On a class of singular nonlinear first order partial differential equations  
. . . . . \*
- 19 Kenta Higuchi (Ritsumeikan Univ.) Resonance free domain for a system of Schrödinger operators with  
energy-level crossings . . . . . \*
- 20 Kengo Terai (Univ. of Tokyo) Remarks on the vanishing discount problem for infinite systems of  
Hamilton–Jacobi–Bellman equations . . . . . \*

**15:40–16:40 Talk Invited by Functional Equations Section**

- Akihito Ebisu (Chiba Inst. of Tech.)<sup>Z</sup> Hypergeometric functions and difference equations

March 16th (Tue) Conference Room V

**9:00–12:00**

- 21 Erbol Zhanpeisov (Univ. of Tokyo)<sup>Z</sup> Blow-up rate of sign-changing solutions to nonlinear parabolic systems  
. . . . . 15



- 22 Piotr Biler (Univ. of Wrocław)<sup>Z</sup> Existence of a forward self-similar solution to a drift-diffusion equation  
Grzegorz Karch (Univ. of Wrocław) ..... 15  
Hiroshi Wakui (Tokyo Univ. of Sci.)
- 23 Shota Tateyama (Univ. of Tokyo)<sup>Z</sup> Hölder gradient estimates on  $L^p$ -viscosity solutions of fully nonlinear  
parabolic equations with VMO coefficients ..... 10
- 24 Nobuhito Miyake (Tohoku Univ.)<sup>Z</sup> Positivity of solutions to the Cauchy problem for linear and semilinear  
Hans-Christoph Grunau biharmonic heat equations ..... 15  
(Univ. of Magdeburg)  
Shinya Okabe (Tohoku Univ.)
- 25 Isamu Ohnishi (Hiroshima Univ.)<sup>Z</sup> Characterization to a time global solution of a nonlinear parabolic PDE  
..... 15
- 26 Toshikazu Kuniya (Kobe Univ.)<sup>Z</sup> Analysis for an SIR epidemic model with diffusion under the different  
boundary conditions ..... 15
- 27 Takayoshi Ogawa (Tohoku Univ.)<sup>Z</sup> Zero relaxation time limit for the solution to the Keller–Segel system  
Masaki Kurokiba to the drift-diffusion equations ..... 15  
(Muroran Inst. of Tech.)
- 28 Yutaro Chiyo (Tokyo Univ. of Sci.)<sup>Z</sup> Remarks on finite-time blow-up in a fully parabolic attraction-repulsion  
Tomomi Yokota (Tokyo Univ. of Sci.) chemotaxis system ..... 15
- 29 Yuya Tanaka (Tokyo Univ. of Sci.)<sup>Z</sup> Finite-time blow-up in a quasilinear parabolic–elliptic Keller–Segel sys-  
tem with logistic source ..... 15
- 30 Mario Fuest (Paderborn Univ.)<sup>Z</sup> Asymptotic behavior in a chemotaxis-consumption model with realistic  
Johannes Lankeit (Paderborn Univ.) boundary conditions for the oxygen ..... 15  
Masaaki Mizukami  
(Tokyo Univ. of Sci.)
- 31 Mikihiro Fujii (Kyushu Univ.) Time periodic solutions to the 2D quasi-geostrophic equation with the  
supercritical dissipation ..... \*
- 32 Kazuhiro Takimoto (Hiroshima Univ.) The exterior Dirichlet problem for the generalized parabolic  $k$ -Hessian  
equations ..... \*

### 13:00–14:00 Talk Invited by Functional Equations Section

- Norisuke Ioku (Tohoku Univ.)<sup>Z</sup> The best constant of the Sobolev type inequality

March 17th (Wed) Conference Room V

### 9:00–12:00

- 33 Ikkei Shimizu (Kyoto Univ.)<sup>Z</sup> Local well-posedness for the Landau–Lifshitz equation with helicity  
term ..... 15
- 34 Koichi Komada (Tohoku Univ.)<sup>Z</sup> Existence of blow-up solutions for quantum Zakharov system ..... 15
- 35 Takuya Sato (Tohoku Univ.)<sup>Z</sup>  $L^2$ -decay for the one dimensional dissipative nonlinear Schrödinger  
equation in the Gevrey class ..... 15
- 36 Yuki Osada (Tokyo Metro. Univ.)<sup>Z</sup> Energy asymptotic expansion of a nonlinear Schrödinger equations with  
three wave interaction ..... 10

- 37 Kazuki Aoki <sup>Z</sup> Asymptotic behavior of solutions to the nonlinear Schrödinger equation on the star graph with the Kirchhoff boundary condition ..... 15  
Takahisa Inui (Osaka Univ.)  
Hayato Miyazaki (Kagawa Univ.)  
Haruya Mizutani (Osaka Univ.)  
Kota Uriya (Okayama Univ. of Sci.)
- 38 Hiroyuki Hirayama (Univ. of Miyazaki) <sup>Z</sup> Optimal Sobolev index for well-posedness of the system of derivative nonlinear Schrödinger equations ..... 15  
Shinya Kinoshita (Univ. Bielefeld)  
Mamoru Okamoto (Osaka Univ.)
- 39 Haruya Mizutani (Osaka Univ.) <sup>Z</sup> Resolvent and Strichartz estimates for fractional Schrödinger operators with Hardy potentials ..... 15  
Xiaohua Yao  
 (Central China Normal Univ.)
- 40 Ryo Muramatsu (Tokyo Univ. of Sci.) <sup>Z</sup> Estimates on modulation spaces for solutions to Schrödinger equations with vector potentials ..... 10
- 41 Satoshi Masaki (Osaka Univ.) <sup>Z</sup> Optimal decay rate of solutions to nonlinear Klein–Gordon systems ..... 15  
Koki Sugiyama (Osaka Univ.)
- 42 Hiroshi Takase (Univ. of Tokyo) <sup>Z</sup> Inverse source problem for a system of wave equations on Lorentzian manifolds ..... 15

**14:15–15:30**

- 43 Kimitoshi Tsutaya (Hirosaki Univ.) <sup>Z</sup> On heatlike lifespan of solutions of semilinear wave equations in Friedmann–Lemaître–Robertson–Walker spacetime ..... 15  
Yuta Wakasugi (Hiroshima Univ.)
- 44 Kimitoshi Tsutaya (Hirosaki Univ.) <sup>Z</sup> Blow up of solutions of semilinear wave equations related to nonlinear waves in accelerated expanding FLRW spacetime ..... 15  
Yuta Wakasugi (Hiroshima Univ.)
- 45 Mamoru Okamoto (Osaka Univ.) <sup>Z</sup> Almost sure global well-posedness for the focusing nonlinear wave equation with a Hartree-type nonlinearity ..... 15  
Tadahiro Oh (Univ. of Edinburgh)  
Leonardo Tolomeo (Univ. Bonn)
- 46 Tomoyuki Tanaka (Nagoya Univ.) <sup>Z</sup> On the critical decay for the wave equation with a cubic convolution in 3D ..... 10  
Kyouhei Wakasa  
 (Kushiro Nat. Coll. of Tech.)
- 47 Tomoyuki Tanaka (Nagoya Univ.) Well-posedness and parabolic smoothing effect for higher order Schrödinger type equations with constant coefficients ..... \*
- 48 Sojiro Murai Strichartz estimates for magnetic wave equation in exterior domain and its application ..... \*  
 (Tokyo Metropolitan Coll. of Indus. Tech.)
- 49 Hironobu Sasaki (Chiba Univ.) The scattering problem for the three-dimensional cubic nonlinear Klein–Gordon equation with rapidly decreasing input data ..... \*
- 50 Masaru Hamano (Saitama Univ.) Instability of standing waves to nonlinear Klein–Gordon equation with an inverse-square potential ..... \*  
Masahiro Ikeda (RIKEN/Keio Univ.)
- 51 Takashi Furuya (Nagoya Univ.) The monotonicity method for the inverse crack scattering problem ... \*
- 52 Gen Nakamura (Hokkaido Univ.) Sampling methods for inverse boundary value problems ..... \*
- 53 Gen Nakamura (Hokkaido Univ.) An inverse boundary value problem for anisotropic elastic equation ... \*

**15:40–16:40 Award Lecture for the 2020 MSJ Analysis Prize**

- Hirokazu Ninomiya (Meiji Univ.) <sup>Z</sup> The world of reaction-diffusion systems

## March 18th (Thu) Conference Room V

**9:00–12:00**

- 54 Tomoki Takahashi (Nagoya Univ.)<sup>Z</sup> Existence of a stationary Navier–Stokes flow past a rigid body, with application to starting problem in higher dimensions ..... 15
- 55 Motofumi Aoki (Tohoku Univ.)<sup>Z</sup> Remark on smoothing property of weak solutions for the Navier–Stokes equations ..... 10  
Tsukasa Iwabuchi (Tohoku Univ.)
- 56 Hideo Kozono<sup>Z</sup> Asymptotic behavior of solutions to elliptic equations with unbounded coefficients of the second order in unbounded domains ..... 15  
(Waseda Univ./Tohoku Univ.)  
Yutaka Terasawa (Nagoya Univ.)  
Yuta Wakasugi (Hiroshima Univ.)
- 57 Hideo Kozono<sup>Z</sup> Asymptotic properties of steady solutions to the 3D axisymmetric Navier–Stokes equations with no swirl ..... 15  
(Waseda Univ./Tohoku Univ.)  
Yutaka Terasawa (Nagoya Univ.)  
Yuta Wakasugi (Hiroshima Univ.)
- 58 Hideo Kozono<sup>Z</sup> Removability of time-dependent singularities of the Stokes equations ..... 15  
(Waseda Univ./Tohoku Univ.)  
Erika Ushikoshi (Yokohama Nat. Univ.)  
Fumitaka Wakabayashi (Waseda Univ.)
- 59 Tatsu-Hiko Miura (Kyoto Univ.)<sup>Z</sup> Global existence of a strong solution to the Navier–Stokes equations in a curved thin domain ..... 15
- 60 Tatsu-Hiko Miura (Kyoto Univ.)<sup>Z</sup> Singular limit problem for the Navier–Stokes equations in a curved thin domain ..... 15
- 61 Miho Murata (Shizuoka Univ.)<sup>Z</sup> The global well-posedness of the compressible fluid model of Korteweg type for the critical case ..... 10  
Takayuki Kobayashi (Osaka Univ.)
- 62 Kai Koike (Kyoto Univ.)<sup>Z</sup> Refined pointwise estimates for the solutions to the one-dimensional compressible Navier–Stokes equations and the long-time behavior of a moving point mass ..... 15
- 63 Ryosuke Nakasato (Tohoku Univ.)<sup>Z</sup> Global well-posedness for the Hall-magnetohydrodynamic system in the critical Besov space ..... 15  
Shuichi Kawashima (Waseda Univ.)  
Takayoshi Ogawa (Tohoku Univ.)

**14:15–15:30**

- 64 Masahiro Suzuki (Nagoya Inst. of Tech.)<sup>Z</sup> Time-periodic solutions of symmetric hyperbolic systems ..... 15  
Masashi Ohnawa  
(Tokyo Univ. of Marine Sci. and Tech.)
- 65 Masahiro Suzuki (Nagoya Inst. of Tech.)<sup>Z</sup> Global bifurcation analysis of an equation of gas discharge ..... 15  
Walter Strauss (Brown Univ.)
- 66 Shota Sakamoto (Tokyo Tech)<sup>Z</sup> Asymptotic stability of an initial-boundary value problem of the Boltzmann equation in 3D half-space ..... 15  
Suzuki Masahiro (Nagoya Inst. of Tech.)  
Katherine Zhiyuan Zhang  
(Courant Inst. of Math. Sci.)
- 67 Tetu Makino (Yamaguchi Univ.)<sup>\*</sup><sup>Z</sup> Asymptotically flat axisymmetric metric generated by rotating compact fluid mass ..... 15
- 68 Takeshi Gotoda (Nagoya Univ.) A sufficient condition for the enstrophy conservation in 2D inviscid flows ..... \*

- 69 Kazuyuki Tsuda Uniform estimates for fractional operators ..... \*
- (Kyushu Sangyo Univ.)  
Reinhard Farwig (TU Darmstadt)
- 70 Natsumi Yoshida (Ritsumeikan Univ.) Asymptotic behavior of solutions toward the rarefaction waves to the Cauchy problem for the scalar conservation law with nonlinear viscosity ..... \*
- 71 Natsumi Yoshida (Ritsumeikan Univ.) Decay properties of solutions toward the rarefaction waves to the Cauchy problem for the scalar conservation law with nonlinear viscosity ..... \*
- 72 Natsumi Yoshida (Ritsumeikan Univ.) Global asymptotic stability of rarefaction waves to the Cauchy problem for the scalar diffusive dispersive conservation law ..... \*
- 73 Natsumi Yoshida (Ritsumeikan Univ.) Global asymptotic stability of a multiwave pattern for the generalized Korteweg–de Vries–Burgers equation ..... \*

**15:40–16:40 Talk Invited by Functional Equations Section**

- Takahiro Okabe (Osaka Univ.)<sup>Z</sup> Asymptotic analysis of the solution to the Navier–Stokes equations by external forces

**Real Analysis**

March 17th (Wed) Conference Room IV

**10:30–11:50**

- 1 Yukino Tomizawa<sup>Z</sup> The modulus of convexity of Busemann spaces ..... 15  
(Niigata Inst. of Tech.)
- 2 Ryota Kawasumi<sup>Z</sup> Calderón–Zygmund operators on Orlicz–Morrey and weak Orlicz–Morrey  
Eiichi Nakai (Ibaraki Univ.) spaces ..... 15
- 3 Naoya Hatano (Chuo Univ./RIKEN)<sup>Z</sup> A global universality of two-layer neural networks with ReLU activations  
Masahiro Ikeda (RIKEN) ..... 15  
Isao Ishikawa (Ehime Univ.)  
Yoshihiro Sawano (Chuo Univ.)
- 4 Kojiro Higuchi (Nihon Univ.)<sup>Z</sup> The natural extensions of positive additive partial functionals ..... 15
- 5 Shin-ya Matsushita (Akita Pref. Univ.)<sup>Z</sup> On primal-dual splitting algorithms ..... 15
- 6 Takeshi Iida Weighted norm inequalities on Morrey spaces for the Orlicz-fractional  
(Fukushima Nat. Coll. of Tech.) maximal operators ..... \*
- 7 Takashi Miyamoto On generalized weak Orlicz spaces and F-norms constructed by  $\varphi$ -  
(Osaka Kyoiku Univ.) functions ..... \*
- Hiro-o Kita (Kagoshima Univ.)<sup>\*</sup>  
Naoko Ogata (Kobe Univ.)
- 8 Ryutaro Arai (Ibaraki Univ.) Boundedness of fractional integrals on martingale Orlicz–Morrey spaces  
..... \*

- 9 Hiroyasu Mizuguchi (Kansai Univ.) A certain geometric constant and von Neumann–Jordan constant in Radon planes . . . . . \*
- 10 Toshiharu Kawasaki On the family of extended integrable functions . . . . . \*  
(Nihon Univ./Tamagawa Univ.)

**14:30–15:30 Talk Invited by Real Analysis Section**

- Koji Aoyama (Chiba Univ.)<sup>Z</sup> Strongly quasinonexpansive mappings and strongly quasinonexpansive sequences of mappings

March 18th (Thu) Conference Room IV

**10:00–11:45**

- 11 Shodai Kubota (Chiba Univ.)<sup>Z</sup> Optimal control problems for one dimensional Fix–Caginalp type systems including singular diffusions . . . . . 15  
Ken Shirakawa (Chiba Univ.)  
Noriaki Yamazaki (Kanagawa Univ.)
- 12 Ken Shirakawa (Chiba Univ.)<sup>Z</sup> Optimal temperature controls for 1D KWC type systems with dynamic boundary conditions . . . . . 15  
Shodai Kubota (Chiba Univ.)  
Ryota Nakayashiki (Salesian Polytech.)
- 13 Takeshi Fukao (Kyoto Univ. of Edu.)<sup>Z</sup> Vanishing diffusion in a dynamic boundary equation for the Cahn–Hilliard system. . . . . 15  
Pierluigi Colli (Univ. of Pavia)
- 14 Chiharu Kosugi (Japan Women’s Univ.)<sup>Z</sup> Existence of weak solutions for the initial and boundary value problems representing stretching and shrinking motion of the compressible elastic material on the plane . . . . . 15  
Toyohiko Aiki (Japan Women’s Univ.)
- 15 Shunsuke Kurima (Tokyo Univ. of Sci.)<sup>Z</sup> Employing a time discretization scheme for a parabolic-hyperbolic phase-field system with nonlocal term . . . . . 15
- 16 Masaaki Mizukami <sup>Z</sup> Uniform-in-time convergence of solutions for a chemotaxis-competition model on the weakly competitive case . . . . . 15  
(Tokyo Univ. of Sci.)

**14:15–14:45**

- 17 Hiroshi Watanabe (Oita Univ.)<sup>Z</sup> Asymptotic behavior of entropy solutions to one-dimensional Cauchy problems for scalar parabolic-hyperbolic conservation laws . . . . . 15
- 18 Kota Kumazaki (Nagasaki Univ.)<sup>Z</sup> Well-posedness of a one-dimensional free boundary problem describing water swelling within thin-elongated pores . . . . . 15
- 19 Noriaki Yamazaki (Kanagawa Univ.) Solvability of quasi-variational evolution inclusions via optimal control problems . . . . . \*  
Nobuyuki Kenmochi (Chiba Univ.\*)  
Ken Shirakawa (Chiba Univ.)
- 20 Makoto Nakamura (Yamagata Univ.) On the Klein–Gordon equation with the Hartree type semilinear term in the de Sitter spacetime . . . . . \*  
Haruki Takashima (Yamagata Univ.)

**15:00–16:00 Talk Invited by Real Analysis Section**

- Kentarou Fujie (Tohoku Univ.)<sup>Z</sup> Global solvability of some quasilinear chemotaxis systems
-

## Functional Analysis

March 16th (Tue)      Conference Room VI

### 9:00–10:30

- 1 Yoritaka Iwata (Kansai Univ.)<sup>Z</sup> Unbounded generalization of logarithmic representation of infinitesimal generators by means of the resolvent operator ..... 15
- 2 Kouichi Taira (Ritsumeikan Univ.)<sup>Z</sup> Uniform Sobolev estimates for discrete Schrödinger operator in dimension three ..... 15
- 3 Yuuya Yoshida (Nagoya Univ.)<sup>Z</sup> Maximum dimension of subspaces with no product basis ..... 15
- 4 Takashi Satomi (Univ. of Tokyo)<sup>Z</sup> The optimal constant of Young–Beckner–Fournier’s convolution inequality on unimodular locally compact groups ..... 15
- 5 Toshihisa Kubo (Ryukoku Univ.)<sup>Z</sup> Palindromic property of Cayley continuants  $\{\text{Cay}_k(x; n)\}_{k=0}^{\infty}$  ..... 15
- 6 Shuji Watanabe (Gunma Univ.) An operator-theoretical treatment of the critical magnetic field of a superconductor in the BCS-Bogoliubov model of superconductivity ... \*

### 11:00–12:00 Talk Invited by Functional Analysis Section

Takuya Mine (Kyoto Inst. Tech.)<sup>Z</sup> Schrödinger operators with point interactions

### 13:00–14:00 Talk Invited by Functional Analysis Section

Toshiyuki Kobayashi (Univ. of Tokyo)<sup>Z</sup> Tempered homogeneous spaces

March 17th (Wed)      Conference Room VI

### 9:00–10:45

- 7 Yuta Enami (Niigata Univ.)<sup>Z</sup> Range preserving maps between spaces of vector-valued continuous functions ..... 15
- 8 Shiho Oi (Niigata Univ.)<sup>Z</sup> 2-local isometries on commutative Banach algebras ..... 15
- 9 Norio Niwa (Nihon Univ.)<sup>Z</sup> Surjective isometries on a Lipschitz space of analytic functions on the open unit disc ..... 15  
Takeshi Miura (Niigata Univ.)
- 10 Keiichi Watanabe (Niigata Univ.)<sup>Z</sup> On mappings between Möbius gyrovector spaces induced from bounded linear operators ..... 15
- 11 Yuki Seo (Osaka Kyoiku Univ.)<sup>Z</sup> Ando–Hiai type inequalities for deformed means ..... 15
- 12 György Pál Gehér (Univ. of Reading)<sup>Z</sup> The structure of maps on the space of all quantum pure states that preserve a fixed quantum angle ..... 15  
Michiya Mori (Univ. of Tokyo)
- 13 Saburo Saitoh Some new type Laurent expansions and division by zero calculus; Spectral theory ..... \*  
(Gunma Univ.\*/Inst. of Reproducing Kernels)  
Hiroshi Okumura
- 14 Takashi Shimomura Bratteli–Vershik model from basic set ..... \*  
(Nagoya Univ. of Economics)
- 15 Yusuke Isono (Kyoto Univ.) Boundary and rigidity of nonsingular Bernoulli actions ..... \*
- 16 Taro Sogabe (Kyoto Univ.) A topological invariant for continuous fields of Cuntz algebras ..... \*
- 17 Yasuo Iida (Kanazawa Med. Univ.) The Zygmund  $F$ -algebra on the upper half plane ..... \*

**11:00–12:00 Award Lecture for the 2020 MSJ Analysis Prize**

Kengo Matsumoto <sup>Z</sup> Continuous orbit equivalence, topological conjugacy of symbolic dynamical systems and  $C^*$ -algebras  
(Joetsu Univ. of Edu.)

**14:30–15:30 Talk Invited by Functional Analysis Section**

Norio Nawata (Osaka Univ.)<sup>Z</sup> Simple stably projectionless  $C^*$ -algebras

## Statistics and Probability

March 15th (Mon)      Conference Room VII

**10:00–12:00**

- 1 Yuki Ueda <sup>Z</sup> Free extreme value theory and its development ..... 15  
(Nat. Inst. of Tech., Ichinoseki Coll.)
- 2 Ikkei Hotta (Yamaguchi Univ.)<sup>Z</sup> On freely quasi-infinitely divisible distributions ..... 15  
Wojciech Młotkowski (Wrocław Univ.)  
Noriyoshi Sakuma (Aichi Univ. of Edu.)  
Yuki Ueda  
(Nat. Inst. of Tech., Ichinoseki Coll.)
- 3 Johannes Jaerisch (Nagoya Univ.)<sup>Z</sup> Mixed Birkhoff spectra of one-dimensional Markov maps ..... 15  
Hiroki Takahasi (Keio Univ.)
- 4 Jean-Dominique Deuschel <sup>Z</sup> Quenched tail estimate for the random walk in random scenery II ..... 10  
(Tech. Univ. Berlin)  
Ryoki Fukushima (Univ. of Tsukuba)
- 5 Naotaka Kajino (Kobe Univ.)<sup>Z</sup> An elementary proof of walk dimension being greater than two for Brownian motion on Sierpiński carpets ..... 15
- 6 Makoto Nakashima (Nagoya Univ.)<sup>Z</sup> Fluctuation in  $L^2$ -region for stochastic heat equation and KPZ equation in higher dimension ..... 15  
Shuta Nakajima (Univ. of Basel)  
Clément Cosco (Weizmann Inst. of Sci.)
- 7 Atsushi Takeuchi <sup>Z</sup> Wasserstein distance of solutions to stochastic differential equations with jumps ..... 15  
(Tokyo Woman's Christian Univ.)

**14:15–15:15 Talk Invited by Statistics and Probability Section**

Dai Taguchi (Okayama Univ.)<sup>Z</sup> Numerical analysis of stochastic differential equations

**15:35–16:35 Talk Invited by Statistics and Probability Section**

Benoît Collins (Kyoto Univ.)<sup>Z</sup> On the operator norm of random matrices

## March 16th (Tue) Conference Room VII

**Morning**

- |    |   |  |
|----|---|--|
| 8  | <u>Saburoou Saitoh</u><br>(Gunma Univ.* / Inst. of Reproducing Kernels)<br>Tsutomu Matsuura (Gunma Univ.)<br>Hiroshi Okumura                          | Probability and stochastic analysis in reproducing kernels and division by zero calculus . . . . . *           |
| 9  | Yong Moo Chung (Hiroshima Univ.)  | Multifractal formalism for multimodal maps . . . . . *   |
| 10 | <u>Toshihiro Uemura</u> (Kansai Univ.)<br>Matsuyo Tomisaki<br>(Nara Women's Univ.*)   | Homogenization of symmetric Dirichlet forms . . . . . *  |
| 11 | Jian Ding (Univ. of Pennsylvania)<br><u>Ryoki Fukushima</u> (Univ. of Tsukuba)<br>Ronfeng Sun (Nat. Univ. of Singapore)<br>Changji Xu (Harvard Univ.) | Geometry of the random walk range conditioned on survival among Bernoulli obstacles . . . . . *                |
| 12 | Jian Ding (Univ. of Pennsylvania)<br><u>Ryoki Fukushima</u> (Univ. of Tsukuba)<br>Ronfeng Sun (Nat. Univ. of Singapore)<br>Changji Xu (Harvard Univ.) | Biased random walk conditioned on survival among Bernoulli obstacles: subcritical phase . . . . . *            |
| 13 | Hiroshi Tsukada (Kagoshima Univ.)   | Pathwise uniqueness and non-contact property of SDEs driven by Cauchy processes with drift . . . . . *         |
| 14 | Satoshi Suzuki (Shimane Univ.)  | Optimality conditions and constraint qualifications for quasiconvex programming . . . . . *                    |
| 15 | Toshiharu Fujita<br>(Kyushu Inst. of Tech.)   | On subproblems for Markov decision process with converging branch system . . . . . *                           |
| 16 | <u>Kento Egashira</u> (Univ. of Tsukuba)<br>Kazuyoshi Yata (Univ. of Tsukuba)<br>Makoto Aoshima (Univ. of Tsukuba)                                    | Asymptotic properties of distance weighted discrimination in high-dimensional settings . . . . . *             |
| 17 | <u>Yugo Nakayama</u> (Kyoto Univ.)<br>Kazuyoshi Yata (Univ. of Tsukuba)<br>Makoto Aoshima (Univ. of Tsukuba)  | Asymptotic properties of kernel PCA for high-dimensional data and application to outlier detection . . . . . * |
| 18 | <u>Ayaka Yagi</u> (Tokyo Univ. of Sci.)<br>Takashi Seo (Tokyo Univ. of Sci.)  | A new test statistic for two mean vectors with monotone missing data . . . . . *                               |
| 19 | <u>Yan Liu</u> (Waseda Univ.)<br>Masanobu Taniguchi (Waseda Univ.)<br>Hernando Ombao<br>(King Abdullah Univ. of Sci. and Tech.)                       | Hypothesis testing for local Granger causality . . . . . *   |
| 20 | Koji Tsukuda (Kyushu Univ.)   | Asymptotic evaluation for moments of length of Pitman partition . . . . *                                      |

## March 17th (Wed) Conference Room VII

**10:00–10:35**

- |    |   |   |
|----|---|---|
| 21 | Xiao-Nan Lu (Univ. of Yamanashi) <sup>Z</sup> | Enumeration and classification of two-level circulant almost orthogonal arrays with strength 2 and bandwidth 1 . . . . . 15 |
|----|---|---|



- 22 Hironu Yumiba <sup>Z</sup>  $E_A^*$ -optimal balanced third-order designs of resolution  $R^*({10, 01})$  with  
(Int. Center for Academic Exchange)  $N < \nu(m)$  for  $3^m$  factorials ..... 15  
Eiji Taniguchi (Ikeda High School)  
Yoshifumi Hyodo  
(Okayama Univ. of Sci.)

**10:55–11:55 Talk Invited by Statistics and Probability Section**

Shoko Chisaki (Osaka Inst. of Tech.)<sup>Z</sup> Design of experiments and their application to deep learning

**14:15–15:00**

- 23 Yuichi Goto (Waseda Univ.)<sup>Z</sup> Likelihood ratio processes under non-standard settings ..... 15  
Takuya Kaneko (Waseda Univ.)  
Soichiro Kojima (Waseda Univ.)  
Masanobu Taniguchi (Waseda Univ.)
- 24 Yuta Koike (Univ. of Tokyo)<sup>Z</sup> High-dimensional central limit theorems for homogeneous sums ..... 15
- 25 Yujie Xue (Waseda Univ.)<sup>Z</sup> Two forms of AIC based on Modified LASSO ..... 10

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

Rie Enomoto (Seikei Univ.)<sup>Z</sup> Consistency properties of some information criteria in the growth curve model under a high-dimensional framework

**Applied Mathematics**

March 15th (Mon) Conference Room VIII

**Morning**

- 1 Ayaka Ishikawa (Yokohama Nat. Univ.) A family of graph quantum walks associated with the Sato zeta function ..... \*
- 2 Iwao Sato (Oyama Nat. Coll. of Tech.) Zeta functions with respect to general coined quantum walk of periodic  
Norio Konno (Yokohama Nat. Univ.) graphs ..... \*  
Takashi Komatsu (Univ. of Tokyo)
- 3 Takashi Komatsu (Univ. of Tokyo) Relationship between the Grover walk and the generalized Ihara zeta  
Norio Konno (Yokohama Nat. Univ.) function ..... \*  
Iwao Sato (Oyama Nat. Coll. of Tech.)
- 4 Sho Kubota (Yokohama Nat. Univ.) Periodicity of a quantum walk defined by mixed cycles ..... \*  
Hiroto Sekido (Yokohama Nat. Univ.)  
Harunobu Yata (Yokohama Nat. Univ.)
- 5 Chusei Kiumi (Yokohama Nat. Univ.) Time-averaged limit measures of two-phase quantum walks with one  
Kei Saito (Kanagawa Univ.) defect ..... \*
- 6 Takako Endo(Watanabe) Eigenvalues of the discrete-time quantum walks in one dimension ..... \*  
(Yokohama Nat. Univ.)

- 7 Akihiro Narimatsu (Yokohama Nat. Univ.) About the time-averaged limit measure of the Grover walk on the 2-dimensional lattice ..... \*
- Masahiro Asano (Yokohama Nat. Univ.)
- Norio Konno (Yokohama Nat. Univ.)
- 8 Takuto Naito (Yokohama Nat. Univ.) Recommendation models based on walks ..... \*
- Chusei Kiumi (Yokohama Nat. Univ.)
- Norio Konno (Yokohama Nat. Univ.)
- Sarato Takahashi (Yokohama Nat. Univ.)
- 9 Ryota Hanaoka (Yokohama Nat. Univ.) Return probability and evolution of the Riesz walk ..... \*
- Norio Konno (Yokohama Nat. Univ.)

March 16th (Tue) Conference Room VIII

**9:30–10:45**

- 10 Shohei Satake (Kumamoto Univ.)<sup>Z</sup> On high-girth expander regular graphs of general degrees with localized eigenvectors ..... 15
- 11 Koji Imamura (Kumamoto Univ.)<sup>Z</sup> Matroid representation over finite rings ..... 10
- Keisuke Shiromoto (Kumamoto Univ.)
- 12 Hidefumi Ohsugi (Kwansei Gakuin Univ.)<sup>Z</sup> Symmetric edge polytopes and matching generating polynomials ..... 15
- Akiyoshi Tsuchiya (Univ. of Tokyo)
- 13 Yusuke Suzuki (Niigata Univ.)<sup>Z</sup> The upper bounds on the size of bipartite and tripartite 1-embeddable graphs on surfaces ..... 15
- Hikari Shibuya (Niigata Univ.)
- 14 Kiyoshi Ando (Nat. Inst. of Information)<sup>Z</sup> Contractible edges and liftable vertices in a 4-connected graph ..... 15
- 15 Masato Kobayashi (Kanagawa Univ.)  $q$ -determinant,  $q$ -Vandermonde and signed bigrassmannian polynomials ..... \*
- 16 Diogo Kendy Matsumoto (Teikyo Univ. of Sci.) An algebraic characterization of complete bipartite graphs ..... \*
- 17 Robert E. L. Aldred (Univ. of Otago) Generalization of the matching extension problem in graphs on surfaces ..... \*
- Jun Fujisawa (Keio Univ.)
- 18 Shinya Fujita (Yokohama City Univ.) The optimal proper connection number of a graph with given independence number ..... \*
- Boram Park (Ajou Univ.)

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

- Yoshio Sano (Univ. of Tsukuba)<sup>Z</sup> Matroidal structures on partially ordered sets and related topics

**13:30–13:50 Presentation Ceremony for the 2020 MSJ Prize for Excellent Young Applied Mathematicians**

March 17th (Wed) Conference Room VIII

**9:40–10:45**

- 19 Aoi Honda (Kyushu Inst. of Tech.)<sup>Z</sup> Model interpretability of Moebius type inclusion-exclusion integral neural networks ..... 15
- Masayuki Itabashi (Kyushu Inst. of Tech.)
- Simon James (Deakin Univ.)

- 20 Hidenori Ogata (Univ. of Electro-Comm.)<sup>Z</sup> Method of fundamental solutions for doubly-periodic potential flow and its invariance under unimodular transforms ..... 15
- 21 Takuya Tsuchiya (Hachinohe Inst. of Tech.)<sup>Z</sup> Hi-precision numerical simulations of Einstein equations for gravitational collapse ..... 15  
Ryosuke Urakawa  
Gen Yoneda (Waseda Univ.)
- 22 Hiroshi Fujiwara (Kyoto Univ.)<sup>Z</sup> Regularization for x-ray computerized tomography as the inverse source problem ..... 15
- 23 Itsuki Watanabe (Waseda Univ.) Deterministic and stochastic models of nonlocal diffusion on inhomogeneous network ..... \*
- 24 Satoru Iwasaki (Osaka Univ.) Asymptotic convergence of solutions of Laplace reaction-diffusion equations ..... \*  
Atsushi Yagi (Osaka Univ.\*)
- 25 Hiroshi Ishii (Hokkaido Univ.) Interaction of front solutions for nonlocal reaction diffusion equation ..... \*  
Shin-Ichiro Ei (Hokkaido Univ.)
- 26 Shin-Ichiro Ei (Hokkaido Univ.) The dynamics of a pulse solution for reaction diffusion systems in multiple half-lines with a junction ..... \*  
Haruki Shimatani (Hokkaido Univ.)  
Ken Mitsuzono (Hokkaido Univ.)
- 27 Takashi Teramoto (Asahikawa Medical Univ.) Traveling two pulse solutions in a three-component FitzHugh–Nagumo model ..... \*  
Peter van Heijster  
(Queensland Univ. of Tech./Wageningen Univ. and Res.)
- 28 Yoshitaka Watanabe (Kyushu Univ.) An improvement of constructive error estimation of approximate solution for biharmonic problems ..... \*  
Takehiko Kinoshita (Saga Univ.)  
Mitsuhiro T. Nakao (Waseda Univ.)
- 29 Syunsuke Kobayashi (Kyoto Univ./RIKEN) Finite difference discretization for the Kuramoto–Sivashinsky equation on expanding circle solution ..... \*  
Shigetoshi Yazaki (Meiji Univ.)

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

- Kohei Nakajima (Univ. of Tokyo)<sup>Z</sup> Physical reservoir computing: pursuing the nature of information processing

**14:15–15:20**

- 30 Ippei Obayashi (RIKEN/Kyoto Univ./Tohoku Univ.)<sup>Z</sup> Stable volumes for persistent homology ..... 15
- 31 Jonathan Jaquette (Boston Univ.)<sup>Z</sup> Global dynamics in a quadratic nonlinear Schrödinger equation ..... 15  
Jean-Philippe Lessard (McGill Univ.)  
Akitoshi Takayasu (Univ. of Tsukuba)
- 32 Takashi Sakajo (Kyoto Univ.)<sup>Z</sup> On a family of rotating equilibria of vortex sheets ..... 15  
Bartosz Protas (McMaster Univ.)
- 33 Takaaki Nishida (Kyoto Univ.\*)<sup>Z</sup> Routes to chaos in Rayleigh–Bénard heat convection ..... 15  
Chun-Hsiung Hsia (Nat. Taiwan Univ.)

## March 18th (Thu) Conference Room VIII

**9:40–10:45**

- 34 Hideki Murakawa (Ryukoku Univ.)<sup>Z</sup> A mathematical model and a numerical method for the formation of epithelial tissues ..... 15  
Rhudaina M. Mohammad (Univ. of the Philippines Diliman)  
Karel Svadlenka (Kyoto Univ.)  
Hideru Togashi (Kobe Univ.)
- 35 Masaharu Nagayama (Hokkaido Univ.)<sup>Z</sup> On a mathematical modeling for a self-propelled material by volume conservation reaction-diffusion systems ..... 15  
Atsushi Mori (Hokkaido Univ.)  
Mamoru Okamoto (Hokkaido Univ.)
- 36 Jumpei Inoue (Waseda Univ.)<sup>Z</sup> Impact of regional differences of recovery rates on the total population of infected in an SIS reaction diffusion model ..... 15  
Kousuke Kuto (Waseda Univ.)
- 37 Hiroko Yamamoto (Univ. of Tokyo)<sup>Z</sup> The Evans function for reaction-diffusion equations with nonlocal effects ..... 15  
Ayuki Sekisaka (Meiji Univ.)
- 38 Hirofumi Honda (Toyo Univ.) Continuous limit of neural network-based multiclass classification ..... \*
- 39 Keiichi Ueda (Univ. of Toyama) Application of autonomous pathfinding system to kinematics problems ..... \*
- 40 Akane Kawaharada Singular function derived from Rule150 ..... \*  
(Kyoto Univ. of Edu.)

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

- Yukihiko Nakata<sup>Z</sup> Dynamics of delay differential equations from epidemic models  
(Aoyama Gakuin Univ.)

**14:15–15:05**

- 41 Kei Nishi (Kyoto Sangyo Univ.)<sup>Z</sup> Pulse bifurcations in a three-component FitzHugh–Nagumo system ... 15  
Yasumasa Nishiura (Hokkaido Univ.)
- 42 Toshiyuki Ogawa (Meiji Univ.)<sup>Z</sup> Bifurcation of a non-trivial traveling wave solution in a 3-component competition-diffusion system ..... 15  
Shin-ichiro Ei (Hokkaido Univ.)  
Hideo Ikeda (Univ. of Toyama)  
Masayasu Mimura (Hiroshima Univ.)
- 43 Masahiro Hiyoshi (Kanazawa Univ.)<sup>Z</sup> Propagation direction of bistable traveling waves for a 3-component Lotka–Volterra competition-diffusion system ..... 15  
Takafumi Yamazaki (Kanazawa Univ.)  
Ken-Ichi Nakamura (Kanazawa Univ.)  
Toshiko Ogiwara (Josai Univ.)

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**Topology**

## March 15th (Mon) Conference Room IX

**10:00–11:00**

- 1 Eri Matsudo (Nihon Univ.)<sup>Z</sup> Coloring links by symmetric group of order 3 ..... 10  
Kazuhiro Ichihara (Nihon Univ.)

- 2 Ryuji Higa (Kobe Univ.)<sup>Z</sup> The intersection polynomials of a virtual knot ..... 10  
Takuji Nakamura (Univ. of Yamanashi)  
Yasutaka Nakanishi (Kobe Univ.)  
Shin Satoh (Kobe Univ.)
- 3 Motoo Tange (Univ. of Tsukuba)<sup>Z</sup> The third term in lens surgery polynomials ..... 15
- 4 Nobutaka Asano (Tohoku Univ.)<sup>Z</sup> 4-manifolds admitting simplified  $(2, 0)$ -trisections with prescribed vertical 3-manifolds ..... 15
- 5 Keiji Tagami (Nat. Fisheries Univ.) Naturality of the dualizable patterns obtained from annulus presentations of knots ..... \*
- 6 Masakazu Teragaito (Hiroshima Univ.) Generalized torsion elements and hyperbolic links ..... \*
- 7 Toshiyuki Akita (Hokkaido Univ.) The adjoint group of a Coxeter quandle ..... \*
- 8 Atsushi Ishii (Univ. of Tsukuba) Twisted derivatives for multiple conjugation quandles ..... \*  
Tomo Murao (Waseda Univ.)
- 9 Kanako Oshiro (Sophia Univ.) Goeritz matrices and Dehn colorings of spatial graphs ..... \*  
Natsumi Oyamaguchi (Shumei Univ.)
- 10 Takayuki Morifuji (Keio Univ.) On simple Hurwitz groups and eta invariant ..... \*

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

Hokuto Konno (Univ. of Tokyo)<sup>Z</sup> Gauge theory and diffeomorphism and homeomorphism groups

March 16th (Tue) Conference Room IX

#### 10:00–11:00

- 11 Naoki Kitazawa (Kyushu Univ.)<sup>Z</sup> Special generic maps and products of cohomology classes of manifolds admitting them ..... 15
- 12 Ramón Barral Lijó (Ritsumeikan Univ.)<sup>Z</sup> Devaney's definition of chaos for foliated spaces ..... 15
- 13 Naohiko Kasuya (Kyoto Sangyo Univ.)<sup>Z</sup> Contact structure on the boundary of a strongly pseudoconcave complex surface ..... 15  
Daniele Zuddas (Univ. of Trieste)
- 14 Sachiko Saito (Hokkaido Univ. of Edu.)<sup>Z</sup> Toric resolutions of germs of Newton non-degenerate mixed polynomials of strongly mixed weighted homogeneous face type ..... 10  
Kosei Takashimizu (Hokkaido Univ. of Edu.)
- 15 Naoki Kitazawa (Kyushu Univ.) Construction of explicit smooth functions on closed or open manifolds inducing given graphs as Reeb graphs ..... \*
- 16 Atsuhide Mori (Osaka Dent. Univ.) On foliations by isochrones ..... \*
- 17 Taro Asuke (Univ. of Tokyo) On a characteristic class associated with deformations of foliations ... \*
- 18 Shin Hayashi Classification of topological invariants related to corner states ..... \*  
(Nat. Inst. of Adv. Industrial Sci. and Tech.)

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

Naoki Fujita (Univ. of Tokyo)<sup>Z</sup> Newton–Okounkov bodies arising from cluster structures and associated toric degenerations

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# Infinite Analysis

March 17th (Wed) Conference Room I

## 10:30–12:00

- 1 Takashi Imoto <sup>Z</sup> The Bethe solutions in the two down-spin sector of the spin-1/2 massive  
(Nat. Inst. of Adv. Industrial Sci. and Tech.) XXZ spin chain ..... 15  
Jun Sato (Ochanomizu Univ.)  
Tetsuo Deguchi (Ochanomizu Univ.)
- 2 Shinsuke Iwao (Tokai Univ.)<sup>Z</sup> Free-fermionic presentation of stable Grothendieck polynomials ..... 15
- 3 Tatsuki Kuwagaki (Osaka Univ.)<sup>Z</sup> Sheaf quantization from exact WKB analysis ..... 15
- 4 Taichiro Takagi <sup>Z</sup> Geometric lifting of the integrable cellular automata with periodic  
(Nat. Defense Acad. of Japan) boundary conditions ..... 15  
Takuma Yoshikawa  
(Nat. Defense Acad. of Japan)
- 5 Akihito Yoneyama (Univ. of Tokyo)<sup>Z</sup> Tetrahedron and 3D reflection equation from PBW basis of the nilpotent  
subalgebra of quantum superalgebras ..... 15

## 14:15–15:15

- 6 Kouichi Takemura (Ochanomizu Univ.)<sup>Z</sup> Initial-value space of  $q$ -Painlevé equation and  $q$ -Heun equation ..... 15  
Shoko Sasaki (Chuo Univ.)  
Shun Takagi (Chuo Univ.)
- 7 Kouichi Takemura (Ochanomizu Univ.)<sup>Z</sup>  $q$ -middle convolution and  $q$ -Painlevé equation ..... 15  
Shoko Sasaki (Chuo Univ.)  
Shun Takagi (Chuo Univ.)
- 8 Ryo Okawa (Kobe Univ.)<sup>Z</sup> Wall-crossing for vortex partition function and handsaw quiver variety  
Yutaka Yoshida (Univ. of Tokyo) ..... 15
- 9 Takeo Kojima (Yamagata Univ.) Quadratic relations of the deformed  $W$ -superalgebra  $\mathcal{W}_{q,t}(\mathfrak{sl}(2|1))$  ..... \*

March 18th (Thu) Conference Room I

## 10:00–11:00 Talk Invited by Infinite Analysis Special Session

Genki Shibukawa (Kobe Univ.)<sup>Z</sup> Let's play multivariate special functions!

## 11:15–12:15 Talk Invited by Infinite Analysis Special Session

Tomoyuki Takenawa <sup>Z</sup> Space of initial conditions and symmetries of higher-dimensional Painlevé  
(Tokyo Univ. of Marine Sci. and Tech.) systems

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