教授 (Professor)

小林 俊行 (KOBAYASHI Toshiyuki)

A. 研究概要

2013–2017 の 5 年間で，1,2,3,4 の研究テーマを中心に総計で約 1,500 ページの論文を著した。以下では 2017 年の出版論文は番号 [1], [2], ⋯ で表記し，2016 年以前の関連する論文はジャーナルの短縮形で引用する。

1. 無限次元表現の分岐則の理論

筆者の長年のモチーフである「分岐則」に関して，定性的理論から定量的理論に移行する新しいプログラムを提起した (日本数学会 70 周年記念企画特別講演，[Progr. Math. '15])．

1.A.(定性的理論 1—有限性) 無限次元表現の分岐則の重複度有限性を与える必要十分条件を証明し [Perspective Math. 2014], さらに，松木敏彦氏とその分類を完成した [Transf. Group 2014].

1.B.（定性的理論 2—離散性）分岐則の離散性の判定条件 (Ann. Math., Invent. Math.) を極小表現に適用して離散的分岐則の生じるケースを分類した [Crelle J. 2015] (大島（芳）と共著)．

1.C.(定量的理論 1—対称性の破れの局所作用素) 対称性の破れの作用素の系統的な構成法 (F-method) を提唱し (単著 [Contemp. Math. 2013])，Pevzner, Souček, Ørsted, 久保氏 等と共同で Rankin–Cohen 作用素や Juhl の共形不変な作用素を新証明で再構成・一般化し ([Adv. Math. 2015], [Selecta Math. 2016], 著書 [13])，種々の幾何構造に対して新しい微分作用素を発見した．

1.D. (定量的理論 2—対称性の破れの分類理論) 簡約リー群の対称性の破れの非局所作用素を完全に記述する最初の成功例を与えた (著書 [14], B. Speh と共同)．その拡張は文献 [5,6,10].

2. 極小表現の大域解析

筆者は，表現論内部の問題意識とは逆の視点で，**極小表現**とよばれる「小さな無限次元表現」をモチーフとした新しい大域解析の可能性を提唱した．特に L^2 模型 (Memoirs AMS, 2011) を使い，保型形式への 1 つの応用 (G. Savin と共同，[Math. Z. 2015]) を与えた．

3. 不連続群

筆者の長年のモチーフである「リーマン幾何学の枠組を越えた不連続群」について，スペクトル理論の構築に初めて踏み込んだ。幾何学的な準備として，離散群の作用の不連続性を量的に評価する sharpness という概念を導入し，高次元タイヒミュラー空間上で**安定な離散スペクトラム**を構成し，長編の論文 [Adv. Math. 2016] を出版した。さらに "安定でない" スペクトラムの存在定理も与えた (文献 [3])．

4. 非対称空間の大域解析

非対称空間上の大域解析は未知の世界である．その研究の基盤のための理論構築を手がけた．

4.A. 幾何学的群論の手法を援用し，非対称空間 G/H の正則表現が L^p 緩増加となるための必要十分条件を H が簡約の場合に証明し [J. Euro. Math. 2015]，それを H が一般の場合に拡張した (Y. Benoist と共同, 文献 [2])．

4.B. 誘導表現の既約分解における重複度の有限性および一様有界性に関する判定条件を，偏微分方程式系の境界値問題を用いて決定した（大島利雄氏と共同 [Adv. Math. 2013]）．

5. 可視的作用と無重複表現

複素多様体における**可視的な作用**という概念を導入し**無重複性の伝播定理**を証明し，無重複表現の統一的な構成を与えた (口頭発表 [8])．

For the last five years, I have been working on the following research topics.

1. **Analysis on non-symmetric spaces**

This is a challenge to the global analysis on homogeneous spaces beyond symmetric spaces.

1.A I introduced a notion of *real spherical manifolds* and established a geometric criterion for finite multiplicities in the induced/restricted representations [Adv.Math. 2013] with T.Oshima.

1.B I classified all symmetric pairs that yield finite-multiplicity branching laws in [Trans. Group, 2014] with T. Matsuki based on the criterion given in [Perspective Math. 2014] and [Adv. Math. 2013].

1.C Jointly with Y. Benoist [J. Euro. Math. '15], we proved a criterion for L^p-temperedness of the regular representation on G/H in the generality that $G \supset H$ are pair of reductive groups, and in [2] for general H.

2. **Analysis on minimal representations**

Minimal representations are one of building blocks of unitary representations. Classic examples are the Weil representation. I proposed a *geometric approach* to minimal representations, by which we could expect a fruitful the-

ory on global analysis by *maximal symmetries*. As an application of the theory of *unitary inversion operator* on the L^2-model that generalizes the Euclidean Fourier transform with G. Mano ([Memoirs of AMS, **1000**, (2011)]), we proved a global multiplicity-one theorem in automorphic form theory with G. Savin in [Math. Z. 2015].

3. **Multiplicity-free representations**

I established the propagation theorem of multiplicity-freeness, which produces various multiplicity-free results as synthetic applications of the original theory of *visible actions* on complex manifolds.

4. **Discontinuous groups**

Developing my continuing motif on discontinuous groups for non-Riemannian homogeneous spaces, I initiated the study on global analysis on locally non-Riemannian symmetric spaces with F. Kassel in [Adv. Math. 2016] and proved the existence of "stable spectrum" under deformation of discontinuous groups. Another new idea is also proposed in [3].

5. **Restriction of representations**

I accomplished the classification of the symmetric pairs $(\mathfrak{g}, \mathfrak{h})$ for which there exists an infinite-dimensional representation of G whose restriction to H is discretely decomposable in [Crelle 2015] with Y. Oshima. In the BGG category $\mathcal{O}$, I proposed an effective method to find singular vectors ('F-method' [Contemp. Math. AMS, 2013]), and joint with B. Ørsted, V. Souček, P. Somberg, M. Pevzner, and T. Kubo determined explicit formulae of covariant differential operators in various geometric settings ([Adv. Math. 2015], [Selecta Math. 2016], and [13]). With B. Speh, I classified *symmetry breaking operators* of spherical principal series for a pair of Lorentz groups [14].

B. 発表論文

(2017 年以降)

1. T. Kobayashi and B. Speh, Symmetry breaking for representations of rank one orthogonal groups II, 305 pages. arXiv: 1801.00158.

2. Y. Benoist and T. Kobayashi, Tempered homogeneous spaces, preprint, 32 pages. arXiv: 1706.10131.

3. T. Kobayashi, Global analysis by hidden symmetry, Progr. Math., **323**, Birkhäuser, (2017), pp. 359–397, (special issue in honour of R. Howe).

4. T. Kobayashi, Residue formula for regular symmetry breaking operators, accepted for publication in Contemporary Mathematics, Amer. Math. Soc. (preprint available at arXiv: 1709.05035).

5. T. Kobayashi, Symmetry Breaking Operators for Orthogonal Groups $O(n, 1)$, 2017 年度表現論シンポジウム講演集 (plenary lectures)，pp. 17–45.

6. T. Kobayashi, Conformal symmetry breaking on differential forms and some applications, accepted for publication in Geometric Methods in Physics XXXVI, in Trends in Math., Birkhäuser Springer. (preprint available at arXiv:1712.0912)

7. T. Kobayashi and B. Speh, Symmetry breaking for orthogonal groups and a conjecture by B. Gross and D. Prasad, accepted for publication in proceedings of the Simons Symposium on Geometric Aspects of the Trace Formula, Simons Symposia, Springer, Cham., 24 pages. (preprint available at arXiv: 1702.00263).

8. T. Kobayashi, T. Kubo, and M. Pevzner, Conformal symmetry breaking operators for anti-de Sitter spaces, In: Geometric Methods in Physics XXXV (eds. P. Kielanowski, A. Odzijewicz, E. Previato), Trends in Math., 2018, pp. 69–85, Birkhäuser.

9. T. Kobayashi, Symmetry breaking operators for orthogonal groups $O(n, 1)$, 3 pages. To appear in Mathematisches Forschungsinstitut Oberwolfach Report No. 25/2017. Harmonic Analysis and the Trace Formula, Organised by W. Müller, S.-W. Shin, B. Speh, and N. Templier.

10. T. Kobayashi and A. Leontiev. Symmetry breaking operators for the restriction of representations of indefinite orthogonal groups $O(p,q)$. Proc. Japan Acad. Ser. A Math. Sci., **93**(8), 2017, 86–91.

11. T. Kobayashi, A. Leontiev, 不定値直交群 $O(p,q)$ の対称性破れ作用素, 第５６回実函数論・函数解析学　合同シンポジウム講演集 (eds. 松本敏隆，渚勝), pp. 1–20, 2017.

12. T. Kobayashi, A. Leotiev, ２つの Gegenbauer 多項式を含むある積分公式 (A certain integral formula containing two Gegenbauer polynoimals) 数理解析研究所講究録" 表現論とその周辺分野の広がり" (ed. 阿部紀行), in press.

著書:

13. T. Kobayashi, T. Kubo, and M. Pevzner. Conformal Symmetry Breaking Operators for Differential Forms on Spheres, Lecture Notes in Mathematics. **2170**, Springer, 2016 年，ix+192 pages. ISBN: 978-981-10-2656-0.

14. T. Kobayashi and B. Speh, "Symmetry Breaking for Representations of Rank One Orthogonal Groups", Mem. Amer. Math. Soc., **238**, アメリカ数学会，2015 年, v+112 pages.

C. 口頭発表

1. The Kemeny Lectures 2017, I. "Universal sounds" of anti-de Sitter manifolds. The Kemeny lectures, II. Local to global-geometry of symmetric spaces with indefinite-metric, III. Analysis on locally pseudo-Riemannian symmetric spaces. Dartmouth College, USA, 3-5 May 2017.

2. Analysis of minimal representations-an approach to quantize nilpotent orbits. (**2.A.**–**2.D.** では講演タイトル，内容は個々に異なるが，大きなテーマとしては同じなので１つにまとめる．) **2.A.** Representation Theory at the Crossroads of Modern Mathematics: Alexandre Kirillov 教授 81 際記念研究集会. Reims, France, 29 May-2 June 2017. **2.B.** International summer research school of CIMPA 2013: Hypergeometric functions and representation theory. Mongolia, 5-16 August 2013 (Plenary, 連続講演). **2.C.** (2 lectures). Analytic Representation Theory of Lie Groups. Kavli IPMU, the University of Tokyo, Japan, 1-4 July 2015. **2.D.** Conformal Geometry and Branching Problems in Representation Theory. Symposium on Representation Theory 2016. Okinawa, Japan, 29 November 29-2 December 2016. (連続講演).

3. Symmetry Breaking Operators in Conformal Geometry. (**3.A.**–**3.K.** では講演タイトル，内容は個々に異なるが，大きなテーマとしては同じなので１つにまとめる．) **3.A.** (opening lecture). Joint meeting of X. International Symposium: Quantum Theory and Symmetries and XII. International Workshop: Lie Theory and Its Applications in Physics. Varna, Bulgaria, 19-25 June 2017. **3.B.** (plenary lecture), the XXXV Workshop on Geometric Methods in Physics. Bialowieza, Poland, 2-8 July 2017. **3.C.** Symposium on Representation Theory 2017. Isawa, Yamanashi, Japan, 28 November-1 December 2017. (special lecture), 日本. **3.D.** "Geometry and Analysis on Locally Symmetric Spaces with Indefinite-metric—after 145 years of Klein's Erlangen Program". Colloquium. Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany, 25 July 2017. **3.E.** Sophus Lie Seminar. Göttingen, Germany, 30 June-1 July 2017. **3.F.** Harmonic Analysis and the Trace Formula. Oberwolfach, Germany, 21-27 May 2017. **3.G.** AMS Special Session on Harmonic Analysis (In Honor of Gestur Olafsson's 65th Birthday). Atlanta, USA, 4 January 2017. **3.H.** Conference on Geometry, Representation Theory and the Baum-Connes Conjecture (Baum 教授 80 歳記念研究集会). The Fields Institute,

Toronto, Ontario, Canada, 18-22 July 2016. **3.I.** International Workshop: Lie Theory and Its Applications in Physics (LT-10). Varna, Bulgaria, 17–23 June 2013. **3.J.** Analysis Seminar. Chalmers University of Technology and the University of Gothenburg, Sweden, 14 May 2013. **3.K.** Geometry, Representation Theory, and Differential Equation, Kyushu University, Japan, 26-19 February 2016.

4. F-method for Constructing Symmetry Breaking Operators I. Abstract Branching Laws for Unitary Highest Weight Modules and Localness Theorem. V. Some Further Perspectives from the General Theory. The 20th Hakuba Workshop on Number Theory in 2017: Automorphic Differential Operators on Siegel Modular Forms (organized by T. Ibukiyama). Nagano, Japan, 3-7 September 2017.

5. Birth of New Branching Problems. 日本数学会 70 周年記念 企画特別講演, 日本数学会秋季総合分科会，Kansai University, Japan, 15-18 September 2016.

6. "Analysis on Non-Riemannian Locally Symmetric Spaces —An Application of Invariant Theory", (**6.A.**–**6.D.** では講演タイトル，内容は個々に異なるが，大きなテーマとしては同じなので１つにまとめる．) **6.A.** Harmonic Analysis, Group Representations, Automorphic Forms and Invariant Theory: in honour of Roger Howe celebrating his 70th birthday (Howe 教授 70 歳記念研究集会). Yale University, USA, 1-5 June 2015. **6.B.** Seminar. Institut Élie Cartan de Lorraine, Nancy, France, 15 October 2015. **6.C.** Workshop: Branching Laws, Quantum Ergodicity, Wave Front Sets & Resonances (organized by M. Pevzner and P. Ramacher. Reims, France, 23-24 October 2015. (2 lectures). **6.D.** Symposium on Representation Theory 2015, 伊豆長岡, Shizuoka, Japan, 17-20 November 2015.

7. Branching Laws for Infinite Dimensional Representations of Real Lie Groups; Symmetry Breaking Operators. (**7.A.**–**7.K.** では講演タイトル，内容は個々に異なるが，大きなテーマとしては同じなので１つにまとめる．) **7.A.** Mathematical Panorama Lectures in celebration of 125th birthday of Srinivasa Ramanujan (ラマヌジャン生誕 125 周年におけるインド数学年記念のパノラマ・レクチャー, 5 回の連続講義). Tata Institute, India, 18–22 February 2013. **7.B.** Representations of reductive groups: (David Vogan 教授還暦記念研究集会) (organized by R. Bezrukavnikov, P. Etingof, G. Lusztig, M. Nevins, and P. Trapa). MIT, USA, 19-23 May 2014. **7.C.** Representation Theory and Groups Actions. The University of Tokyo, Tokyo, Japan, 12 July 2014. **7.D.** Workshop on New Developments in Representation Theory (opening lecture), Singapore, 14 March 2016. **7.E.** (2 回連続講演) Berkeley-Tokyo Winter School: Geometry, Topology and Representation Theory. University of California, Berkeley, USA, 8-19 February 2016. **7.F.** (opening lecture). Journees SL2R (Strasbourg, Lorraine, Luxembourg, Reims): Théorie des Representations et Analyse Harmonique. Institut Elie Cartan de Lorraine, France, 9-10 June 2016. **7.G.** Analysis, Geometry and Representations on Lie Groups and Homogeneous Spaces (河添健教授および Ahmed Intissar 教授の還暦記念研究集会). Marrakech, Morocco, 8-12 December 2014. **7.H.** Symmetry Breaking Operators and Branching Problems. Symposium on Representation Theory 2014. Awajishima, Japan, 25-28 November 2014. (連続講演) **7.I.** Symmetry Breaking Operators and Branching Problems. Algebraic Geometry Seminar. Zurich University, Switzerland, 6 October 2014. **7.J.** Symmetry Breaking Operators for Rank One Orthogonal Groups. Prehomogeneous Vector Spaces and Related Topics (organized by Slupinski, Soufaifi, Y. Hironaka, H. Ochiai; scientific advisors: Rubenthaler and F. Sato). Rikkyo University, Tokyo, Japan,

1–5 September 2014. **7.K.** Tutorials and Workshop on New Developments in Representation Theory. Singapore, 14 March 2016.

8. Visible Actions and Multiplicity-free Representations. XVIth International Conference on Geometry, Integrability and Quantization. Varna, Bulgaria, 6–11 June 2014.

9. Finite Multiplicity Theorems and Real Spherical Varieties. (**9.A.–9.F.** では講演タイトル，内容は個々に異なるが，大きなテーマとしては同じなので１つにまとめる．) **9.A.** 松木敏彦教授還暦記念研究集会. Tottori, Japan, 8–9, February 2014. **9.B.** Representation Theory and Analysis of Reductive Groups: Spherical Spaces and Hecke Algebras Oberwolfach, Germany, 19–25 January 2014. **9.C.** Workshop on Representations of Lie Groups and their Subgroups (organized by G. Zhang). Chalmers University of Technology, Sweden, 19–20 September 2013. **9.D.** Representations of Reductive Groups Salt Lake City, USA, 8–12 July 2013. **9.E.** Group Actions with applications in Geometry and Analysis: in honour of Toshiyuki Kobayashi 50th birthday. Reims, France, 3–6 June 2013. **9.F.** F-method III. Geometry, Representation Theory, and Differential Equations. Kyushu University, 16-19 February 2016.

10. Global Geometry and Analysis on Locally Symmetric Spaces—Beyond the Riemannian Case. (**10.A.–10.P.** では講演タイトル，内容は個々に異なるが，大きなテーマとしては同じなので１つにまとめる．) **10.A.** Analysis on Manifolds with Symmetries and Related Structures. University of Bath, UK, 28-29 June 2016. **10.B.** Workshop: Deformation of Discrete Groups and Related Topics. Nagoya University, Nagoya, Japan, 17-18 February 2015. **10.C.** The 11th International Workshop: Lie Theory and Its Applications in Physics (LT-11). Varna, Bulgaria, 15-21 June 2015. **10.D.** Kyushu University, 談話会，Fukuoka, Japan, 15 January 2015. **10.E.** JSPS-DST Asian Academic Seminar 2013: Discrete Mathematics & its Applications. the University of Tokyo, Japan, 3–10 November 2013. **10.F.** Sophus Lie Days. Cornell, USA, 11 October 2013. **10.G.** Japan–Netherlands Seminar. Nagoya University, Japan, 26–30 August 2013. **10.H.** Hayama Symposium on Complex Analysis in Several Variables XVI. Kanagawa, Japan, 20-23 July 2013. **10.I.** 談話会. Kyushu University, Fukuoka, Japan, 15 January 2015. **10.J.** 談話会. Tohoku University, Sendai, Japan, 15 December 2014. **10.K.** 談話会. The University of Tokyo, Tokyo, Japan, 11 July 2014. **10.L.** Sophus Lie Days. Cornell, USA, 11 October 2013. **10.M.** Journée Mathématique de la Fédération de Recherche. Logis du Roy, Amiens, France, 2 July 2013. **10.N.** Colloquium de Mathématiques de Rennes. Institut de Recherche mathématique de Rennes, France, 10 June 2013. **10.O.** Chalmers University of Technology and the University of Gothenburg, 談話会，Sweden, 20 May 2013. **10.P.** "Rigidity in geometry and spectral analysis on non-Riemnnnian locally homogeneous manifolds", Workshop: Deformation of Discrete Groups and Related Topics. Nagoya University, Nagoya, Japan, 17-18 February 2015.

D. 講義 (学生さんは記入されなくてもよい。)

1. 数理科学概論 I: 微積分，Taylor 展開，偏微分，近似と概算，微分方程式の初歩，多変数関数の積分を講義し，約 200 題の演習で講義を補った．(教養学部文科 1, 2 年生)

2. 数物先端科学 III・幾何学 XH: 簡約リー群の既約な無限次元表現の構成と分類の考え方について $SL(2,\mathbb{R})$ を例として解説した．さらに，シンプレクティック多様体の幾何的量子化の立場から，リー群が簡約でない場合も含めて，ユニタリ表現の軌道法の入門講義を行った．(数理大学院・4 年生共通講義)

3. 数学講究 XB（数理科学概説）「対称性と大域幾何学」，(理学部数学科 4 年生)，2017 年 7 月 19 日.

4. 数学講究 XA, 数学特別講究，通年: テキスト Bergeron, "The Spectrum of Hyperbolic Surfaces"(理学部数学科 4 年生)

E. 修士・博士論文 (学生さんは記入されなくてもよい。)

1. (修士) 甘中 一輝 (KANNAKA Kazuki): 反ド・ジッター空間における無限生成の強不連続性を有さないある不連続群の軌道の数え上げについて

F. 対外研究サービス

1. Kavli IPMU(数物宇宙連携機構), 上席科学研究員併任 (2009.8–2011.5); 主任研究員 (Principal Investigator) 併任 (2011.6–)

[ジャーナルのエディター]

2. Managing Editor, Japanese Journal of Mathematics (日本数学会) (2005–)

3. Editor, International Mathematics Research Notices (Oxford 大学出版) (2002–)

4. Managing Editor, Takagi Booklet, vol. 1–18 (日本数学会) (2006–)

5. Editor, Geometriae Dedicata (Springer) (2000–)

6. Editor, Advances in Pure and Applied Mathematics (de Gruyter) (2008–)

7. Editor, International Journal of Mathematics (World Scientific) (2004–)

8. Editor, Journal of Mathematical Sciences, The University of Tokyo (2007–)

9. Editor, Kyoto Journal of Mathematics (2010–)

10. Editor, Representation Theory (アメリカ数学会) (2015–)

11. Editor, AMS Translation Series (アメリカ数学会) (2016–)

12. Editor, Tunijian Journal of Mathematics (2017–)

13. Editor, Special Issue in commemoration of Professor Kunihiko Kodaira's centennial birthday (J. Math. Sciences, the University of Tokyo) (2015).

14. Editor, Special Issue in honor of Professor Masaki Kashiwara's 70th birthday (Publ. RIMS) 2017–.

15. Chief Editor, Mikio Sato's Collected Papers.

16. 共立出版,『共立講座 数学探検（全 18 巻）』,『共立講座 数学の魅力（全 14 巻+別巻 1）』,『共立講座 数学の輝き（全 40 巻予定）』の３シリーズ編集委員

17. 編集委員，数学の現在 i, e, π, (with 斎藤毅，河東泰之)，東京大学出版会, 2016.

[学会・他大学の委員など]

18. 審査委員: European Research Council (2010–)

19. 京都大学数理解析研究所運営委員 (2015–2017; 2017–)

20. 京都大学数理解析研究所専門委員 (2007–2009; 2009–2011; 2015–2017; 2017–)

21. 科学研究費等の審査委員: 日本 (JSPS), 米国 (NSF-AMS), EU, ドイツ, ルクセンブルク, 中華人民共和国・香港 (various years)

22. 審査委員: Prize Committee 日本数学会春季賞·秋季賞他 (anonymous) (various years)

[国際研究集会のオーガナイザーなど]

23. オーガナイザー，Summer School on Representation Theory, リー群の群作用と大域解析に関するセミナー，玉原国際セミナーハウス，16–20 August 2017.

24. Scientific Committee, Visible Actions and Multiplicity-free Representations. XVIIth International Conference on Geometry, Integrability and Quantization. Varna, Bulgaria, 2016.

25. オーガナイザー，Summer School on Representation Theory，リー群の群作用と大域解析セミナー，玉原国際セミナーハウス，10–14 August 2016.

26. オーガナイザー，Winter School 2016 on Representation Theory of Real Reductive Groups，東京大学大学院数理科学研究科，22–27 January 2016. Coorganized with Toshihisa Kubo and Hideko Sekiguchi.

27. オーガナイザー，Summer School on Representation Theory，リー群の群作用と大域解析セミナー，玉原国際セミナーハウス，4–8 August 2015.

28. オーガナイザー，Analytic representation theory of Lie groups, 1–4 July 2015, Kavli 数物連携宇宙研究機構，東京大学.

29. オーガナイザー，Winter School 2015 on Representation Theory of Real Reductive Groups，東京大学大学院数理科学研究科，24–26 January 2015. Coorganized with Toshihisa Kubo, Hisayosi Matumoto and Hideko Sekiguchi.

30. オーガナイザー，Summer School on Representation Theory，玉原国際セミナーハウス，28–31 August 2014.

31. オーガナイザー，Winter School on Representation Theory of Real Reductive Groups, 東大，15–18 February 2014, (with T. Kubo, H. Matumoto and H. Sekiguchi).

32. オーガナイザー，Session "Representation Theory" in JSPS-DST Asian Academic Seminar 2013: Discrete Mathematics & Its Applications (小谷元子他)，The University of Tokyo, Japan, 7 November, 2013.

33. オーガナイザー，Representations of Lie Groups and Supergroups, Oberwolfach, Germany, 10–16 March 2013 (with J. Hilgert, K.-H. Neeb and T. Ratiu)

34. オーガナイザー，高木レクチャー，第 12 回 (東京大学, 2013 年 5 月), 第 13 回 (京都大学数理研, 2013 年 11 月), 第 14 回（東京大学, 2014 年 5 月），第 15 回（東北大学，2015 年 6 月），第 16 回（東京大学，2015 年 11 月），第 17 回（京都大学数理研，2016 年 6 月），第 18 回（東京大学，2016 年 11 月），第 19 回（京都大学数理研，2017 年 7 月），第 20 回（東京大学，2017 年 11 月）(with Y. Kawahigashi, H. Nakajima, K. Ono and T. Saito)

35. オーガナイザー，リー群論・表現論セミナー (2007–present 東大; 2003–2007 RIMS; 1987–2001 東大)

G. 受賞

1. アメリカ数学会フェロー (2017)「簡約リー群の構造論と表現論に対する貢献」(Contribution to Structure Theory and Representation Theory of Reductive Lie groups)

2. 2015 JMSJ 論文賞 (The JMSJ Outstanding Paper Prize)「極小表現の構成に関する論文 Minimal representations via Bessel operators」に関して」(J. Hilgert, J. Möllers との共同受賞)

3. 紫綬褒章 (Medal with Purple Ribbon)(2014) 数学研究

H. 海外からのビジター

1. Roger Howe, Yale University, July, 2017, delivered the Takagi Lectures.

2. Salma Nasrin, Dhaka University, Bangladesh, June 4-17, 2017. Worked on orbit method in representation theory.

3. Andrei Okounkov, Chicago University, USA, November 3–4, 2017, delivered the Takagi Lectures.

4. Fanny Kassel, IHES, France November 6-18, 2017, Worked on locally pseudo-Riemannian symmetric spaces.

連携併任講座