# Atsushi Tsukazaki：塚﨑　敦

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## Education：

2005.3.25 Ph.D (Chemistry), Department of Chemistry, Tohoku University
東北大学大学院理学研究科化学専攻　博士課程修了 博士（理学）

2002.3.26 M. Sc. of Engineering, Department of Innovative and Engineering Materials, Tokyo Institute of Technology
東京工業大学大学院総合理工学研究科物質科学創造専攻　修士課程修了

2000.3 B. Sc. Department of Inorganic Materials, Tokyo Institute of Technology
東京工業大学工学部無機材料工学科修了

## Research interests：

epitaxial thin film growth, molecular beam epitaxy, quantum transport, electric-field effect
oxide electronics, topological insulators,

## Professional career：

2002.4～2005.3 日本学術振興会特別研究員（DC1）
2005.4～2006.3 東北大学金属材料研究所　超構造薄膜化学研究部門　博士研究員
2006.4～2007.3 日本学術振興会特別研究員（PD）
2007.4～2010.5 東北大学金属材料研究所　超構造薄膜化学研究部門　助教
2010.6～2012.8 東京大学大学院工学系研究科付属量子相エレクトロニクス研究センター　特任講師
2012.9～2013.3 東京大学大学院新領域創成科学研究科　物質系専攻　准教授
2013.4～　　現職

兼任
2008.10～2012.3 科学技術振興機構戦略的創造研究事業さきがけ　研究員
2012.10～2016.3 科学技術振興機構戦略的創造研究事業さきがけ　研究員
2013.4～2014.3 理化学研究所　創発物性科学研究センター強相関界面研究グループ　客員研究員
2014.4～　　理化学研究所　創発物性科学研究センター強相関界面研究グループ　客員主管研究員
2016.4～2017.9 科学技術振興機構　研究開発戦略センター(JST-CRDS)　特任フェロー

## Awards：

I, JSAP Young Scientist Award for the Presentation of an Excellent Paper (2001)
I, 19th Advanced Technology Award, Nippon broadcasting system, inc. prize (2005)
I, 22th Inoue Research Award for Young Scientists (2005)
I, 28th JSAP Award for the Most Promising Young Scientist (2006)
I, 48th Harada young Researcher Award (2008)
I, 7th Condensed-Matter Science Prize (2012)

## List of Publication

**2020**

1) Single-domain formation of $SrMnBi_2$ films on polar $LaAlO_3$ substrate
K. Takahashi, J. Shiogai, H. Inoue, S. Ito, S. Kimura, S. Awaji, **A. Tsukazaki**
AIP Advances **10**, 105216 (2020).

2) Molecular beam epitaxy of superconducting $Sn_{1-x}In_xTe$ thin films
M. Masuko, R. Yoshimi, **A. Tsukazaki**, M. Kawamura, K. S. Takahashi, M. Kawasaki, Y. Tokura
Physical Review Materials **4**, 091202(R) (2020).

3) Direct observation of the statics and dynamics of emergent magnetic monopoloes in a chiral magnet
N. Kanazawa, A. Kitaori, J. S. White, V. Ukleev, H. M. Ronnow, **A. Tsukazaki**, M. Ichikawa, M. Kawasaki, Y. Tokura
Physical Review Letters **125**, 137202 (2020).

4) Microwave response of interacting oxide two-dimensional electron systems
D. Tabrea, I. A. Dmitriev, S. I. Dorozhkin, B. P. Gorshunov, A. V. Boris, Y. Kozuka, **A. Tsukazaki**, M. Kawasaki, K. von Klitzing, J. Falson
Physical Review B **102**, 115432 (2020).

5) Giant magneto-optical responses in magnetic Weyl semimetal $Co_3Sn_2S_2$
Y. Okamura, S. Minami, Y. Kato, Y. Fujishiro, Y. Kaneko, J. Ikeda, J. Muramoto, R. Kaneko, K. Ueda, V. Kocsis, N. Kanazawa, Y. Taguchi, T. Koretsune, K. Fujiwara, **A. Tsukazaki**, R. Arita, Y. Tokura, Y. Takahashi
Nature Communications **11**, 4619 (2020).

6) Stabilization of a honeycomb lattice of $IrO_6$ octahedra by formation of ilmenite-type superlattices in $MnTiO_3$
K. Miura, K. Fujiwara, K. Nakayama, R. Ishikawa, N. Shibata, **A. Tsukazaki**
Communications Materials **1**, 55 (2020).

7) Current scaling of the topological quantum phase transition between a quantum anomalous Hall insulator and a trivial insulator
M. Kawamura, M. Mogi, R. Yoshimi, **A. Tsukazaki**, Y. Kozuka, K. S. Takahashi, M. Kawasaki, Y. Tokura
Physical Review B **102**, 041301(R) (2020). Rapid communication.

8) Inhomogeneous interface dipole effect at the Schottky junctions of $PdCrO_2$ on $\beta$-$Ga_2O_3$ (201) substrates
T. Miyakawa, T. Harada, S. Ito, **A. Tsukazaki**
Journal of Applied Physics **128**, 025302 (2020).

9) Large non-reciprocal charge transport mediated by quantum anomalous Hall edge states
K. Yasuda, T. Morimoto, R. Yoshimi, M. Mogi, **A. Tsukazaki**, M. Kawamura, K. S. Takahashi, M. Kawasaki, N. Nagaosa, Y. Tokura
Nature Nanotechnology **15**, 831 (2020).

10) Insulator-to-metal transition of $Cr_2O_3$ thin films via isovalent $Ru^{3+}$ substitution
K. Fujiwara, M. Kitamura, D. Shiga, Y. Niwa, K. Horiba, T. Nojima, H. Ohta, H. Kumigashira, **A. Tsukazaki**
Chemistry of Materials **32**, 5272-5279 (2020).

11) Dynamic characteristics of $PdCoO_2$ / $\beta$-$Ga_2O_3$ Schottky junctions
T. Harada, **A. Tsukazaki**
Applied Physics Letters **116**, 232104 (2020).

12) Two-dimensional growth of conductive ultra-thin Sn films on insulating substrate with an Fe buffer layer
D. Zheng, J. Shiogai, H. Inoue, S. Souma, T. Sato, **A. Tsukazaki**
APL Materials **8**, 061103 (2020).

13) Magnetic-field-induced topological phase transition in Fe-doped $(Bi,Sb)_2Se_3$ heterostructures
Y. Satake, J. Shiogai, G. P. Mazur, S. Kimura, S. Awaji, K. Fujiwara, T. Nojima, K. Nomura, S. Souma, T. Sato, T. Dietl, **A. Tsukazaki**
Physical Review Materials **4**, 044202 (2020). Selected as Editor's suggestion.

14) Control of Schottky barrier height in metal/$\beta$-$Ga_2O_3$ junctions by insertion of $PdCoO_2$ layers
T. Harada, **A. Tsukazaki**

APL Materials **8**, 041109 (2020). Selected as a featured article.

15) Precise resistance measurement of quantum anomalous Hall effect in magnetic heterostructure film of topological insulator
Y. Okazaki, T. Oe, M. Kawamura, R. Yoshimi, S. Nakamura, S. Takeda, M. Mogi, K. S. Takahashi, **A. Tsukazaki**, M. Kawasaki, Y. Tokura, N-H. Kaneko

16) Signature of band inversion in the perovskite thin-film alloy $BaSn_{1-x}Pb_xO_3$
J. Shiogai, T. Chida, K. Hashimoto, K. Fujiwara, T. Sasaki, **A. Tsukazaki**
Physical Review B **101**, 125125 (2020).
Applied Physics Letters **116**, 143101 (2020). Selected as a featured article.

17) Electrical detection of the antifferomagnetic transition in $MnTiO_3$ ultrathin films by spin Hall magnetoresistance
K. Miura, K. Fujiwara, J. Shiogai, T. Nojima, **A. Tsukazaki**
Journal of Applied Physics **127**, 103903 (2020).

18) Anomalous Hall effect at the spontaneously electron-doped polar surface of $PdCoO_2$ ultrathin films
T. Harada, K. Sugawara, K. Fujiwara, M. Kitamura, T. Nojima, K. Horiba, H. Kumigashira, T. Takahashi, T. Sato, **A. Tsukazaki**
Physical Review Research **2**, 013282 (2020).

19) A platform for making and transferring oxide films
**A. Tsukazaki**
Nature News&Views **578**, 41 (2020).

**2019**

20) Ordering phenomena of spin trimers accompanied by a large geometrical Hall effect
S. Gao, M. Hirschberger, O. Zaharko, T. Nakajima, T. Kurumaji, A. Kikkawa, J. Shiogai, **A. Tsukazaki**, S. Kimura, S. Awaji, Y. Taguchi, T. Arima, Y. Tokura
Physical Review B **100**, 241115(R) (2019).

21) Doping-induced enhancement of anomalous Hall coefficient in Fe-Sn nanocrystalline films for highly sensitive Hall sensors
K. Fujiwara, Y. Satake, J. Shiogai, **A. Tsukazaki**
APL Materials **7**, 111103 (2019).

22) Low-frequency noise measurements on Fe-Sn Hall sensors
J. Shiogai, Z. Jin, Y. Satake, K. Fujiwara, **A. Tsukazaki**
Applied Physics Express **12**, 123001 (2019).

23) Electric dipole effect in $PdCoO_2/\beta$-$Ga_2O_3$ Schottky diodes for high-temperature operation
T. Harada, S. Ito, **A. Tsukazaki**
Science Advances **5**, eaax5733 (2019).

24) Ballistic transport in periodically modulated MgZnO/ZnO two-dimensional electron systems
K. Tanaka, J. Falson, Y. Kozuka, M. Uchida, D. Maryenko, J. T. Ye, Y. Iwasa, **A. Tsukazaki**, J. H. Smet, M. Kawasaki
Applied Physics Letters **115**, 153101 (2019). Selected as an Editor's Pick.

25) Quantum anomalous Hall effect driven by magnetic proximity coupling in all-telluride based heterostructure
R. Watanabe, R. Yoshimi, M. Kawamura, M. Mogi, **A. Tsukazaki**, X. Z. Yu, K. Nakajima, K.S. Takahashi, M. Kawasaki, Y. Tokura
Applied Physics Letters **115**, 102403 (2019).

26) Large anomalous Hall effect in topological insulators with proximitized ferromagnetic insulators
M. Mogi, T. Nakajima, V. Ukleev, **A. Tsukazaki**, R. Yoshimi, M. Kawamura, K.S. Takahashi, T. Hanashima, K. Kakurai, T. Arima, M. Kawasaki, Y. Tokura
Physical Review Letters **123**, 016804 (2019).

27) Nonreciprocal charge transport at topological insulator/superconductor interface
K. Yasuda, H. Yasuda, R. Yoshimi, T. Liang, **A. Tsukazaki**, K. S. Takahashi, N. Nagaosa, M. Kawasaki, Y. Tokura
Nature Communications **10**, 2734 (2019). https://doi.org/10.1038/s41467-019-10658-3

28) Ferromagnetic $Co_3Sn_2S_2$ thin films fabricated by co-sputtering
K. Fujiwara, J. Ikeda, J. Shiogai, T. Seki, K. Takanashi, **A. Tsukazaki**

Japanese Journal of Applied Physics Rapid Communications **58**, 050912 (2019).

29) Quantized conductance of one-dimensional strongly correlated electrons in an oxide heterostructure
H. Hou, Y. Kozuka, J-W. Liao, L. W. Smith, D. Kos, J. P. Griffiths, J. Falson, **A. Tsukazaki**, M. Kawasaki, C. J. B. Ford
Physical Review B **99**, 121302(R) (2019).

30) Growth control of corundum-derivative $MnSnO_3$ thin films by pulsed-laser deposition
K. Miura, K. Fujiwara, **A. Tsukazaki**
AIP Advances **9**, 035210 (2019).

31) Fe-Sn nanocrystalline films for flexible magnetic sensors with high temperature stability
Y. Satake, K. Fujiwara, J. Shiogai, T. Seki, **A. Tsukazaki**
Scientific Reports **9**, 3282 (2019).

32) Formation of distorted rutile-type $NbO_2$, $MoO_2$, and $WO_2$ films by reactive sputtering
K. Fujiwara, **A. Tsukazaki**
Journal of Applied Physics **125**, 085301 (2019).

33) Giant thermoelectric power factor in ultrathin FeSe superconductor
S. Shimizu, J. Shiogai, N. Takemori, S. Sakai, H. Ikeda, R. Arita, T. Nojima, **A. Tsukazaki**, Y. Iwasa
Nature Communications **10**, 825 (2019). https://doi.org/10.1038/s41467-019-08784-z

34) Magnetic topological insulators
Y. Tokura, K. Yasuda, **A. Tsukazaki**
Nature Reviews Physics **1**, 126-143 (2019).

35) Thin-film stabilization of $LiNbO_3$–type $ZnSnO_3$ and $MgSnO_3$ by molecular-beam epitaxy
K. Fujiwara, H. Minato, J. Shiogai, A. Kumamoto, N. Shibata, **A. Tsukazaki**
APL Materials **7**, 022505 (2019).

**2018**

36) Pulsed-laser deposition of InSe thin films for the detection of thickness-dependent bandgap modification
D. Zheng, J. Shiogai, K. Fujiwara, **A. Tsukazaki**
Applied Physics Letters **113**, 253501 (2018).

37) Current-driven magnetization switching in ferromagnetic bulk Rashba semiconductor (Ge,Mn)Te
R. Yoshimi, K. Yasuda, **A. Tsukazaki**, K. S. Takahashi, M. Kawasaki, Y. Tokura
Science Advances **4**, eaat9989 (2018).

38) Andreev reflection at the interface with an oxide in the quantum Hall regime
Y. Kozuka, A. Sakaguchi, J. Falson, **A. Tsukazaki**, M. Kawasaki
Journal of the Physical Society of Japan **87**, 124712 (2018).

39) Emergence of interfacial conduction and ferromagnetism in MnTe/InP
R. Watanabe, R. Yoshimi, M. Shirai, T. Tanigaki, M. Kawamura, **A. Tsukazaki**, K. S. Takahashi, R. Arita, M. Kawasaki, Y. Tokura
Applied Physics Letters **113**, 181602 (2018).

40) Topological quantum phase transition in magnetic topological insulator upon magnetization rotation
M. Kawamura, M. Mogi, R. Yoshimi, **A. Tsukazaki**, Y. Kozuka, K. S. Takahashi, M. Kawasaki, Y. Tokura
Physical Review B **98**, 140404(R) (2018). Rapid communication.

41) Ferromagnetic insulator $Cr_2Ge_2Te_6$ thin films with perpendicular remanence
M. Mogi, **A. Tsukazaki**, Y. Kaneko, R. Yoshimi, K. S. Takahashi, M. Kawasaki, Y. Tokura
APL Materials **6**, 091104 (2018). Selected as a featured article.

42) Effect of the depletion region in topological insulator heterostructures for ambipolar field-effect transistors
Y. Satake, J. Shiogai, K. Fujiwara, **A. Tsukazaki**
Physical Review B **98**, 125415 (2018).

43) A cascade of phase transitions in an orbitally mixed half-filled Landau level
J. Falson, D. Tabrea, D. Zhang, I. Sodemann, Y. Kozuka, **A. Tsukazaki**, M. Kawasaki, K. von Klitzing, J. H. Smet
Science Advances **4**, eaat8742 (2018).

44) Anisotropy of the upper critical field and its thickness dependence in superconducting FeSe electric double layer

transistors
J. Shiogai, S. Kimura, S. Awaji, T. Nojima, **A. Tsukazaki**
Physical Review B **97**, 174520(2018). Editor's suggestion.

45) High-mobility field-effect transistor based on crystalline $ZnSnO_3$ thin films
H. Minato, K. Fujiwara, **A. Tsukazaki**
AIP Advances **8**, 055327 (2018).

46) Highly conductive $PdCoO_2$ ultrathin films for transparent electrodes
T. Harada, K. Fujiwara, **A. Tsukazaki**
APL Materials **6**, 046107 (2018). Editor's Pick.

47) Critical-current enhancement driven by suppression of superconducting fluctuation in ion-gated ultrathin FeSe
T. Harada, J. Shiogai, T. Miyakawa, T. Nojima, **A. Tsukazaki**
Superconductivity Science and Technology **31**, 055003 (2018).

48) Enhancement of superconducting transition temperature in FeSe electric-double-layer transistor with multivalent ionic liquids
T. Miyakawa, J. Shiogai, S. Shimizu, M. Matsumoto, Y. Ito, T. Harada, K. Fujiwara, T. Nojima, Y. Itoh, T. Aida, Y. Iwasa, **A. Tsukazaki**
Physical Review Materials **2**, 031801(R) (2018). Rapid Communication & Editor's suggestion.

49) Fermi level tuning of Dirac surface state in $(Bi_{1-x}Sb_x)_2Se_3$ alloy thin films
Y. Satake, J. Shiogai, D. Takane, K. Yamada, K. Fujiwara, S. Souma, T. Sato, T. Takahashi, **A. Tsukazaki**
Journal of Physics: Condensed Matter **30**, 085501 (2018).

50) Large magneto-thermopower in MnGe with topological spin texture
Y. Fujishiro, N. Kanazawa, T. Shimojima, A. Nakamura, K. Ishizaka, T. Koretsune, R. Arita, A. Miyake, H. Mitamura, K. Akiba, J. Shiogai, S. Kimura, S. Awaji, **A. Tsukazaki**, A. Kikkawa, Y. Taguchi, and Y. Tokura
Nature Communications **9**, 408 (2018).

51) All-in-all-out Magnetic domain inversion in $Tb_2Ir_2O_7$ with molecular fields anti-parallel to external fields
T. C. Fujita, Y. Kozuka, J. Matsuno, M. Uchida, **A. Tsukazaki**, T. Arima, M. Kawasaki
Physical Review Materials **2**, 011402(R) (2019).

**2017**

52) Topological spin-hedgehog crystals of a chiral magnet as engineered with magnetic anisotropy
N. Kanazawa, J. S. White, H. M. Ronnow, C. D. Dewhurst, D. Morikawa, K. Shibata, T. Arima, F. Kagawa, **A. Tsukazaki**, Y. Kozuka, M. Ichikawa, M. Kawasaki, Y. Tokura
Physical Review B Rapid Communication **96**, 220414(R) (2017).

53) Visualizing ferroic domains in an all-in-all-out antiferromagnet thin film
Y. Kozuka, T. C. Fujita, M. Uchida, T. Nojima, **A. Tsukazaki**, J. Matsuno, T. Arima, M. Kawasaki
Physical Review B **96**, 224417 (2017).

54) Observation of superparamagnetism in coexistence with quantum anomalous Hall $C = \pm 1$ and $C = 0$ Chern states
E. O. Lachman, M. Mogi, J. Sarkar, A. Uri, K. Bagani, Y. Anahory, Y. Myasoedov, M. E. Huber, **A. Tsukazaki**, M. Kawasaki, Y. Tokura, E. Zeldov
npj Quantum Materials **2**, 70 (2017).

55) Quantized chiral edge conduction on reconfigurable domain walls of a magnetic topological insulator
K. Yasuda, M. Mogi, R. Yoshimi, **A. Tsukazaki**, K. S. Takahashi, M. Kawasaki, F. Kagawa, Y. Tokura
Science **358**, 1311 (2017).

56) Tailoring tricolor structure of magnetic topological insulator for robust axion insulator
M. Mogi, M. Kawamura, **A. Tsukazaki**, R. Yoshimi, K. S. Takahashi, M. Kawasaki, Y. Tokura
Science Advances **3**, eaao1669 (2017).

57) Current-nonlinear Hall effect and spin-orbit torque magnetization switching in a magnetic topological insulator
K. Yasuda, **A. Tsukazaki**, R. Yoshimi, K. Kondou, K. S. Takahashi, Y. Otani, M. Kawasaki, Y. Tokura
Physical Review Letters **119**, 137204 (2017).

58) Fabrication of tetragonal FeSe - FeS alloy films with high sulfur contents by alternate deposition
K. Fujiwara, J. Shiogai, **A. Tsukazaki**
Japanese Journal of Applied Physics, Rapid communications **56**, 100308 (2017).

59) Nonlinear response of a MgZnO/ZnO heterostructure close to zero bias
Q. Shi, J. Falson, M. A. Zudov, Y. Kozuka, **A. Tsukazaki**, M. Kawasaki, J. Smet
Physical Review B **96**, 125401 (2017).

60) A versatile patterning process based on easily soluble sacrificial bilayer
T. Harada, **A. Tsukazaki**
AIP Advances **7**, 085011 (2017).

61) Current-driven instability of the quantum anomalous Hall effect in ferromagnetic topological insulators
M. Kawamura, R. Yoshimi, **A. Tsukazaki**, K. S. Takahashi, M. Kawasaki, Y. Tokura
Physical Review Letters **119**, 016803 (2017).

62) Enhanced electron mobility at the two-dimensional metallic surface of $BaSnO_3$ electric-double-layer transistor at low temperatures
K. Fujiwara, K. Nishihara, J. Shiogai, **A. Tsukazaki**
Applied Physics Letters **110**, 203503 (2017).

63) Observation of anomalous Hall effect in a non-magnetic two-dimensional electron system
D. Maryenko, A. S. Mishchenko, M. S. Bahramy, A. Ernst, J. Falson, Y. Kozuka, **A. Tsukazaki**, N. Nagaosa, M. Kawasaki
Nature Communications **8**, 14777 (2017). DOI: 10.1038/ncomms14777

64) Unified trend of superconducting transition temperature against Hall coefficient for ultrathin FeSe films prepared on different oxide substrates
J. Shiogai, T. Miyakawa, Y. Ito, T. Nojima, **A. Tsukazaki**
Physical Review B **95**, 115101 (2017).

65) A magnetic heterostructure of topological insulators: a candidate for axion insulator
M. Mogi, M. Kawamura, R. Yoshimi, **A. Tsukazaki**, Y. Kozuka, K. S. Takahashi, M. Kawasaki, Y. Tokura
Nature Materials **16**, 516 (2017).

66) Hall field-induced resistance oscillations in MgZnO/ZnO heterostructures
Q. Shi, M. A. Zudov, J. Falson, Y. Kozuka, **A. Tsukazaki**, M. Kawasaki, K. von Klitzing, J. Smet
Physical Review B **95**, 041411(R) (2017).

67) Alloy disorder modulated electron transport at $Mg_xZn_{1-x}O$/ZnO heterointerface
A. Vishnuradhan, Y. Kozuka, M. Uchida, J. Falson, **A. Tsukazaki**, M. Kawasaki
AIP Advances **7**, 015029 (2017).

**2016**

68) Direct observation of the anisotropic magnetic field response of the spin helix in FeGe thin film
N. Kanazawa, J. S. White, H. M. Ronnow, C. D. Dewhurst, Y. Fujishiro, **A. Tsukazaki**, Y. Kozuka, M. Kawasaki, M. Ichikawa, F. Kagawa, Y. Tokura
Physical review B **94**, 184432 (2016).

69) Co thin films deposited directly on ZnO polar surfaces
D. Chiba, N. Shibata, **A. Tsukazaki**
Scientific Reports **6**, 38005 (2016).

70) Large unidirectional magnetoresistance in a magnetic topological insulator
K. Yasuda, **A. Tsukazaki**, R. Yoshimi, K. S. Takahashi, M. Kawasaki, Y. Tokura
Physical Review Letters **117**, 127202 (2016).

71) High field-effect mobility at the (Sr.Ba)$SnO_3$ / $BaSnO_3$ interface
K. Fujiwara, K. Nishihara, J. Shiogai, **A. Tsukazaki**
AIP Advances **6**, 085014 (2016).

72) Fermi-level-dependent charge-to-spin current conversion by Dirac surface states of topological insulators
K. Kondou, R. Yoshimi, **A. Tsukazaki**, Y. Fukumra, J. Matsuno, K. S. Takahashi, M. Kawasaki, Y. Tokura, Y. Otani
Nature Physics **12**, 1027 (2016).

73) Zero-bias photocurrent in ferromagnetic topological insulator
N. Ogawa, R. Yoshimi, **A. Tsukazaki**, M. Kawasaki, Y. Tokura
Nature Communications **7**:12246 (2016), DOI:10.1038/ncomms12246.

74) Terahertz spectroscopy on Faraday and Kerr rotations in quantum anomalous Hall state
K. N. Okada, Y. Takahashi, M. Mogi, R. Yoshimi, **A. Tsukazaki**, K. S. Takahashi, N. Ogawa, M. Kawasaki, Y. Tokura
Nature Communications **7**:12245 (2016), DOI:10.1038/ncomms12245.

75) Improvement of electron mobility in La:$BaSnO_3$ thin films by the insertion of atomically-flat insulating (Sr,Ba)$SnO_3$ buffer layer
J. Shiogai, K. Nishihara, K. Sato, **A. Tsukazaki**
AIP advances **6**, 065305 (2016).

76) MgZnO/ZnO heterostructures with electron mobility exceeding $1 \times 10^6$ $cm^2/Vs$
J. Falson, Y. Kozuka, M. Uchida, J. H. Smet, T. Arima, **A. Tsukazaki**, M. Kawasaki
Scientific Reports **6**:26598 (2016), DOI:10.1038/srep26598.

77) Observation of the quantum Hall effect in $\delta$-doped $SrTiO_3$
Y. Matsubara, K. S. Takahashi, M. S. Bahramy, Y. Kozuka, D. Maryenko, J. Falson, **A. Tsukazaki**, Y. Tokura, M. Kawasaki
Nature Communications **7**:11631 (2016), DOI:10.1038/ncomms11631.

78) Geometrical Hall effects in topological insulator heterostructures
K. Yasuda, R. Wakatsuki, T. Morimoto, R. Yoshimi, **A. Tsukazaki**, K. S. Takahashi, M. Ezawa, M. Kawasaki, N. Nagaosa, Y. Tokura
Nature Physics **12**, 555 (2016).

79) All-in-all-out magnetic domain wall conduction in pyrochlore iridate heterointerface
T. C. Fujita, M. Uchida, Y. Kozuka, W. Sano, **A. Tsukazaki**, T. Arima, M. Kawasaki
Physical Review B **93**, 064419 (2016). Editor's suggestion.

80) Enhanced photovoltaic current in topological insulators via Fermi energy tuning
K. N. Okada, N. Ogawa, R. Yoshimi, **A. Tsukazaki**, K. S. Takahashi, M. Kawasaki, Y. Tokura
Physical Review B **83**, 081403(R) (2016). Rapid communication.

81) Quantum Hall effect in a bulk antiferromagnet $EuMnBi_2$ with magnetically confined two-dimensional Dirac fermions
H. Masuda, H. Sakai, M. Tokunaga, Y. Yamasaki, A. Miyake, J. Shiogai, S. Nakamura, S. Awaji, **A. Tsukazaki**, H. Nakao, Y. Murakami, T. Arima, Y. Tokura, S. Ishiwata
Science Advances **2**, e1501117 (2016).

82) Observation of microwave induced resistance and photovoltage oscillations in MgZnO/ZnO heterostructures
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K. Tamura, T. Makino, **A. Tsukazaki**, M. Sumiya, S. Fuke, T. Furumochi, M. Lippmaa, C. H. Chia, Y. Segawa, H. Koinuma, M. Kawasaki
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176) Defects in ZnO thin films grown on $ScAlMgO_4$ substrates probed by a monoenergetic positron beam
A. Uedono, T. Koida, **A. Tsukazaki**, M. Kawasaki, Z. Q. Chen, S. F. Chichibu, H. Koinuma
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177) Quantitative control and detection of heterovalent impurities in ZnO thin films grown by pulsed laser deposition.
M. Sumiya, S. Fuke, **A. Tsukazaki**, K. Tamura, A. Ohtomo, M. Kawasaki, H. Koinuma
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T. Fukumura, Y. Yamada, K. Tamura, K. Nakajima, T. Aoyama, **A. Tsukazaki**, M. Sumiya, S. Fuke, Y. Segawa, T. Chikyow, T. Hasegawa, H. Koinuma, M. Kawasaki
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179) Correlation between the photoluminescence lifetime and defect density in bulk and epitaxial ZnO
T. Koida, S. F. Chichibu, A. Uedono, **A. Tsukazaki**, M. Kawasaki, T. Sota, Y. Segawa, H. Koinuma
Applied Physics Letters **82**, 532 (2003).

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180) Systematic examination of carrier polarity in composition spread ZnO thin films codoped with Ga and N
**A. Tsukazaki**, H. Saito, K. Tamura, M. Ohtani, H. Koinuma, M. Sumiya, S. Fuke, T. Fukumura, M. Kawasaki
Applied Physics Letters **81**, 235 (2002).

181) Photoreflectance spectra of a ZnO heteroepitaxial film on the nearly lattice-matched $ScAlMgO_4$ (0001) substrate grown by laser molecular-beam epitaxy.
S. F. Chichibu, **A. Tsukazaki**, M. Kawasaki, K. Tamura, Y. Segawa, T. Sota, H. Koinuma
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182) Investigation of ZnO/sapphire interface and formation of ZnO nanocrystalline by Laser MBE.
I. Ohkubo, Y. Matsumoto, A. Ohtomo, T. Ohnishi, **A. Tsukazaki**, M. Lippmaa, H. Koinuma, M. Kawasaki
Applied Surface Science **159-160**, 514 (2000).

## List of conference presentations: (only invited talks in international conferences)

1) Thin film devices based on topological materials
**A. Tsukazaki**
3rd EPiQS-TMS alliance workshop on topological materials science, UCSB USA, Oct. 21-25, 2019.

2) Interface engineering of Sn-based oxide semiconductors
**A. Tsukazaki**
Compound semiconductor week (CSW2019), Nara, May 19-22, 2019.

3) High-Tc superconductivity in FeSe electric-double-layer transistor
**A. Tsukazaki**

The 8th Indo-Japan Seminar, Tokyo, Jan. 31- Feb. 2, 2019.

4) Emergent phenomena at the thin films heterostructures
**A. Tsukazaki**
Summit of Materials Science (SMS2018), Sendai, Oct. 29-30, 2018.

5) Edge current control in magnetic topological insulator heterostructures
**A. Tsukazaki**
MRS spring meeting, Phoenix USA April 4, 2018.

6) Quantum anomalous Hall effect in topological insulator Cr-doped $(Bi,Sb)_2Te_3$ heterostructures
**A. Tsukazaki**
TOPO MAT meeting, Stuttgart, Germany Sep. 19-21, 2016.

7) High-$T_c$ Superconductivity in FeSe electric-double-layer transistor
**A. Tsukazaki**
Symposium on Quantum Materials Synthesis (QMS), NY USA Aug.30-Sep.1, 2016.

8) Electrochemical etching approach to 'ultrathin' superconductor FeSe in EDL transistor configuration
**A. Tsukazaki**
RIKEN Topical meeting, Wako December 10-11, 2015.

9) Quantized Hall effects in topological insulator field-effect transistors
**A. Tsukazaki**
New trends in topological insulator, San Sebastian, Spain, July 8, 2015.

10) Polarization engineering in polar-semiconductor ZnO heterostructures
**A. Tsukazaki**
Seminar in Max Planck Institute, Stuttgart, Germany. March 9, 2015

11) Transport properties of the surface states in $(Bi_{1-x}Sb_x)_2Te_3$ thin film devices
**A. Tsukazaki**
The Asia-Pacific Workshop on Strongly correlated system 2014 (APW-2014), Beijing, Oct. 10, 2014.

12) High mobility 2D transport in well-regulated ZnO based wurtzite heterostructures
**A. Tsukazaki**
MRS Fall meeting, Boston, USA, December 4, 2013.

13) Polar discontinuity effect in Wurtzite ZnO based heterostructures
**A. Tsukazaki**
JSAP-MRS symposia, Kyoto, September 19, 2013.

14) Interface engineering for high mobility 2DEG on polar-oxide semiconductos
**A. Tsukazaki**
The 40th international symposium on Compound Semiconductors, Kobe, May 23, 2013.

15) Quantum Hall effect in MgZnO/ZnO heterostructures
**A. Tsukazaki**
4th International Workshop on Emergent Phenomena in Quantum Hall Systems (EPQHS),
Beijing, China, June 23-26, 2011.

16) Fractional quantum Hall effect at the MgZnO/ZnO heterointerfaces
**A. Tsukazaki**
38th International symposium on Compound Semiconductors (ISCS), Berlin, Germany, May 22-26, 2011.

17) Emergence of fractional quantum Hall states in well-regulated MgZnO/ZnO heterostructures
**A. Tsukazaki**, Y. Kozuka, M. Kawasaki
MRS spring meeting, 2011 San Francisco, USA, April 27, 2011.

18) Fractional Quantum Hall effect in MgZnO/ZnO heterostructures
**A. Tsukazaki**, S. Akasaka, K. Nakahara, A. Kamisawa, Y. Ohno, H. Ohno, A. Ohtomo, M. Kawasaki
The 2010 WPI-AIMR Annual Workshop, Sendai, March 25-27, 2010.

19) Observation of fractional quantum Hall effect in MgZnO/ZnO based heterostructures
**A. Tsukazaki**
American Physical Society March meeting, Portland, USA, March 15-19, 2010.

20) 2D electron transport in $Mg_xZn_{1-x}O$ based heterostructures
**A. Tsukazaki**, A. Ohtomo, S. Akasaka, K. Nakahara, Y. Ohno, H. Ohno, M. Kawasaki,
JSPS Core program meeting, Korea, Oct. 24, 2009.

21) Quantum transport at MgZnO/ZnO interface
**A. Tsukazaki**
CNSI- RIEC Workshop on Nanoelectronics, Spintronics and Photonics, Santa Barbara, USA ,Oct. 9-10, 2008.

22) Quantum transport phenomena in $Mg_xZn_{1-x}O$/ZnO heterointerface
**A. Tsukazaki**
ATI international workshop, CREST international workshop, and Global COE international workshop on Spin currents, Japan, Feb. 19, 2008.

23) Atomically controlled heteroepitaxy of ZnO enabling UV emitting and quantum Hall devices
**A. Tsukazaki**, A. Ohtomo, M. Kawasaki
The Minerals, Metals and Materials Society (TMS) 2008 Annual Meeting & Exhibition, Louisiana, USA, March 10, 2008.

24) Highly controlled epitaxy of ZnO for light emitting devices
**A. Tsukazaki**, A. Ohtomo, M. Kubota, T. Onuma, S. F. Chichibu, M. Sumiya, S. Fuke, T. Kita, K. Ohtani, Y. Ohno, H. Ohno, T. Makino, Y. Segawa, H. Koinuma, M. Kawasaki
International Symposium on Advanced Ceramics, Singapore, Dec. 14, 2006.

25) Key materials aspects for valence control of ZnO
**A. Tsukazaki**
American Physical Society March meeting, Baltimore, USA, 2006.

26) Blue light emitting diode based on ZnO
**A. Tsukazaki**, M. Kubota, A. Ohtomo, T. Onuma, K. Ohtani, H. Ohno, S. F. Chichibu, M. Kawasaki
$67^{th}$ autumn meeting of Japan Society of Applied Physics, Japan, 2006.

27) Optical and electrical properties of ZnO films
**A. Tsukazaki**, A. Ohtomo, M. Kawasaki, M. Kubota, T. Onuma, S. F. Chichibu, M. Sumiya, S. Fuke, T. Kita, K. Ohtani, Y. Ohno, H. Ohno, T. Makino, Y. Segawa, H. Koinuma
COE mini-workshop on "Strongly Correlated Electronics", Kashiwa, Jan. 14, 2006.

28) Advances in ZnO thin film growth by laser molecular beam epitaxy
**A. Tsukazaki**, A. Ohtomo, M. Kawasaki, M. Kubota, T. Onuma, S. F. Chichibu, M. Sumiya, S. Fuke, T. Kita, K. Ohtani, Y. Ohno, H. Ohno, T. Makino, Y. Segawa, H. Koinuma
Materials Research Society Fall meeting, Boston, USA, 2005.

29) Layer-by-layer growth of nitrogen doped ZnO single crystalline films
**A. Tsukazaki**, A. Ohtomo, M. Kawasaki
AFOSR ZnO workshop in Maui, USA, May 17, 2004.