

# Curriculum Vitae



1. Research field: Condensed matter theory
2. Name: Hiroyuki YAMASE (Male)
3. Nationality: Japanese
4. Current positions and addresses:  
Principal Researcher  
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Guest Professor  
Hokkaido University, Sapporo, JAPAN

5. Carrer:  
April 2015 — present: Guest Professor in Hokkaido University  
April 2015 — present: Principal Researcher in NIMS in Tsukuba  
June 2013 — February 2015: Guest Scientist in MPI in Stuttgart  
December 2011 — May 2013: Humboldt Research Fellow in MPI in Stuttgart  
May 2009 — March 2015: Guest Associate Professor in Hokkaido University  
August 2008 — March 2015: Senior Researcher in NIMS in Tsukuba  
April 2004 — July 2008: Postdoctoral Researcher in MPI in Stuttgart  
September 2003 — October 2003: Guest Scientist in MPI in Stuttgart  
April 2001 — March 2004: Special Postdoctoral Researcher in RIKEN, Wako

6. Education:  
March 2001: Ph. D. in Department of Physics in Graduate School of Science, University of Tokyo  
"Quasi-one-dimensional picture of Fermi surface  
in La-based high- $T_c$  cuprates — A view from  $t$ - $J$  model"  
supervisor: Prof. Hidetoshi Fukuyama
- March 1998: M. S. in Department of Physics in Graduate School of Science, University of Tokyo  
"Effects of charge density modulations in high  $T_c$  cuprates"  
supervisor: Prof. Hidetoshi Fukuyama
- March 1996: B. S. in Department of Physics in Faculty of Science and Technology, Keio University  
"Boson and Fermion (in Japanese)"  
supervisor: Prof. Rejiro Fukuda

7. Awards:
  - ◊ Humboldt Research Fellowship for experienced researchers (August 2011)
  - ◊ Poster Award in "The 8th International Conference in Spectroscopies of Novel Superconductors (SNS2007)" in Sendai (August 2007)

# Publications (Refereed)

¶: representative papers

(81) S. Nakata, M. Bejas, J. Okamoto, K. Yamamoto, D. Shiga, R. Takahashi, H. Y. Huang, H. Kumigashira, H. Wadati, J. Miyawaki, S. Ishida, H. Eisaki, A. Fujimori, A. Greco, H. Yamase, D. J. Huang, H. Suzuki

“Out-of-phase Plasmon Excitations in the Trilayer Cuprate  $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_{10+\delta}$ ”

arXiv: 2502.03779

¶(80) H. Yamase

“Theory of charge dynamics in bilayer electron system with long-range Coulomb interaction”

Phys. Rev. B **111** (2025) 085138-1 - 085138-21.

(79) A. Nag, L. Zinni, J. Choi, J. Li, S. Tu, A. C. Walters, S. Agrestini, S. M. Hayden, M. Bejas, Z. Lin, H. Yamase, K. Jin, M. García-Fernández, J. Fink, A. Greco, Ke-Jin Zhou

“Impact of electron correlations on two-particle charge response in electron- and hole-doped cuprates”

Phys. Rev. Res. **6** (2024) 043184-1 - 043184-14.

(78) M. Homenda, P. Jakubczyk, and H. Yamase

“Generalized Hertz action and quantum criticality of two-dimensional Fermi systems”

Phys. Rev. B **110** (2024) L121102-1 - L121102-6.

¶(77) M. Zafur and H. Yamase

“Spin and bond-charge excitation spectra in correlated electron systems near antiferromagnetic phase”

Phys. Rev. B **109** (2024) 245127-1 - 245127-26.

(76) M. Bejas, V. Zimmermann, D. Betto, T. D. Boyko, R. J. Green, T. Loew,

N. B. Brookes, G. Cristiani, G. Logvenov, M. Minola, B. Keimer, H. Yamase,

A. Greco, and M. Hepting

“Plasmon dispersion in bilayer cuprate superconductors”

Phys. Rev. B **109** (2024) 144516-1 - 144516-8.

(75) H. Yamase, M. Bejas, and A. Greco

“Retaining Landau quasiparticles in the presence of realistic charge fluctuations in cuprates”

Phys. Rev. B **109** (2024) 104515-1 - 104515-9.

(74) M. Hepting, T. D. Boyko, V. Zimmermann, M. Bejas, Y. E. Suyolcu, P. Puphal,

R. J. Green, L. Zinni, J. Kim, D. Casa, M. H. Upton, D. Wong, C. Schulz, M. Bartkowiak,

K. Habicht, E. Pomjakushima, G. Cristiani, G. Logvenov, M. Minola, H. Yamase,

A. Greco, and B. Keimer

“Evolution of plasmon excitations across the phase diagram of the cuprate superconductor  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ ”

Phys. Rev. B **107** (2023) 214516-1 - 214516-18.

¶(73) H. Yamase

”Spin-fluctuation glue disfavors high-critical temperature of superconductivity?”  
New J. Phys. **25** (2023) 083049.

¶(72) H. Yamase, M. Bejas, and A. Greco

”Plasmarons in high-temperature cuprate superconductors”  
Commun. Phys. **6** (2023) 168.

(71) L. Zinni, M. Bejas, H. Yamase, and A. Greco

”Low-energy plasmon excitations in infinite-layer nickelate”  
Phys. Rev. B **107** (2023) 014503-1 - 014503-9.

(70) H. Yamase

”Ferromagnetic and metamagnetic transitions in itinerant electron systems: a microscopic study”  
New J. Phys. **25** (2023) 033004.

(69) H. Yamase

”Suppression of superconductivity by spin fluctuations”  
J. Phys. Conf. Ser. **2164** (2022) 012013.

(68) M. Hepting, M. Bejas, A. Nag, H. Yamase, N. Coppola, D. Betto, M. Garcia-Fernandez,

S. Agrestini, K.-J. Zhou, M. Minola, C. Sacco, L. Maritato, P. Orgiani, H. I. Wei,  
K. M. Shen, D. G. Schlom, A. Galdi, A. Greco, and B. Keimer

”Gapped collective charge excitations and interlayer hopping in cuprate superconductors”  
Phys. Rev. Lett. **129** (2022) 047001-1 - 047001-8.

¶(67) H. Yamase

”Theoretical insights into electronic nematic order, bond-charge orders, and plasmons in cuprate superconductors”

J. Phys. Soc. Jpn. **90** (2021) 111011-1 - 111011-16.

¶(66) H. Yamase and M. Zafur

”Anomaly of longitudinal spin susceptibility at superconducting instability inside a magnetic phase”

Phys. Rev. B **103** (2021) 224527-1 - 224527-9.

¶(65) H. Yamase, M. Bejas, and A. Greco

”Electron self-energy from quantum charge fluctuations in the layered  $t$ - $J$  model with long-range Coulomb interaction”

Phys. Rev. B **104** (2021) 045141-1 - 045141-22.

¶(64) H. Yamase, Y. Sakurai, M. Fujita, S. Wakimoto, and K. Yamada

”Fermi surface in La-based cuprate superconductors from Compton scattering imaging”  
Nat. Commun. **12** (2021) 2223-1 - 2223-7.

- (63) A. Nag, M. Zhu, M. Bejas, J. Li, H. C. Robarts, H. Yamase, A. N. Petsch, D. Song, H. Eisaki, A. C. Walters, M. García-Fernández, A. Greco, S. M. Hayden, and K.-J. Zhou  
"Detection of acoustic plasmons in hole-doped lanthanum and bismuth cuprate superconductors using resonant inelastic x-ray scattering"  
Phys. Rev. Lett. **125** (2020) 257002-1 - 257002-6.
- (62) T. Terashima, Y. Matsushita, H. Yamase, N. Kikugawa, H. Abe, M. Imai, S. Uji, S. Ishida, H. Eisaki, A. Iyo, K. Kihou, C.-H. Lee, T. Wang, and G. Mu  
"Elastoresistance measurements on CaKFe<sub>4</sub>As<sub>4</sub> and KCa<sub>2</sub>Fe<sub>4</sub>As<sub>4</sub>F<sub>2</sub> with the Fe site of  $C_{2v}$  symmetry"  
Phys. Rev. B **102** (2020) 054511-1 - 054511-7.
- (61) A. Greco, H. Yamase, and M. Bejas  
"Close inspection of plasmon excitations in cuprate superconductors"  
Phys. Rev. B **102** (2020) 024509-1 - 024509-6.
- ¶(60) H. Yamase and T. Agatsuma  
"Suppression of superconductivity by spin fluctuations in iron-based superconductors"  
Phys. Rev. B **102** (2020) 060504(R)-1 - 060504(R)-4.
- ¶(59) W. Metzner and H. Yamase  
"Phase stiffness in an antiferromagnetic superconductor"  
Phys. Rev. B **100** (2019) 014504-1 - 014504-12.
- (58) H. Yamase, M. Bejas, and A. Greco  
"Doping dependence of  $d$ -wave bond-charge excitations in electron-doped cuprates"  
Phys. Rev. B **99** (2019) 014513-1 - 014513-7.
- ¶(57) A. Greco, H. Yamase, and M. Bejas  
"Origin of the high-energy charge excitations observed by resonant inelastic x-ray scattering in cuprate superconductors"  
Commun. Phys. **2** (2019) 3.
- (56) M. Bejas, H. Yamase, and A. Greco  
"Dual structure in the charge excitation spectrum of electron-doped cuprates"  
Phys. Rev. B **96** (2017) 214513-1 - 214513-12.
- ¶(55) K. Kuboki and H. Yamase  
"Static spin susceptibility in magnetically ordered states"  
Phys. Rev. B **96** (2017) 064411-1 - 064411-8.
- (54) A. Greco, H. Yamase, and M. Bejas  
"Charge-Density-Excitation Spectrum in the  $t-t'-J-V$  Model"  
J. Phys. Soc. Jpn. **86** (2017) 034706-1 - 034706-5.

- (53) T. Agatsuma and H. Yamase  
 "Structure of the pairing gap from orbital nematic fluctuations"  
*Phys. Rev. B* **94** (2016) 214505-1 - 214505-9.
- (52) A. Eberlein, W. Metzner, S. Sachdev, and H. Yamase  
 "Fermi surface reconstruction and drop in the Hall number due to spiral antiferromagnetism in high- $T_c$  cuprates"  
*Phys. Rev. Lett.* **117** (2016) 187001-1 - 187001-6.
- ¶(51) A. Greco, H. Yamase, and M. Bejas  
 "Plasmon excitations in layered high- $T_c$  cuprates"  
*Phys. Rev. B* **94** (2016) 075139-1 - 075139-8.
- ¶(50) H. Yamase, A. Eberlein, and W. Metzner  
 "Coexistence of incommensurate magnetism and superconductivity in the two-dimensional Hubbard model"  
*Phys. Rev. Lett.* **116** (2016) 096402-1 - 096402-6.
- (49) H. Yamase, M. Bejas, and A. Greco  
 " $d$ -wave bond-order charge excitations in electron-doped cuprates"  
*Europhys. Lett.* **111** (2015) 57005-p1 - 57005-p6.
- ¶(48) H. Yamase and R. Zeyher  
 "Spin nematic fluctuations near a spin-density-wave phase"  
*New J. Phys.* **17** (2015) 073030-1 - 073030-12.
- (47) H. Yamase  
 "Griffiths wings associated with electronic nematic transition"  
*J. Phys.: Conference Series* **592** (2015) 012102-1 - 012102-7.
- ¶(46) H. Yamase  
 "Electronic nematic phase transition in the presence of anisotropy"  
*Phys. Rev. B* **91** (2015) 195121-1 - 195121-9.
- (45) M. Bejas, A. Greco, and H. Yamase  
 "Strong particle-hole asymmetry of charge instabilities in doped Mott insulators"  
*New J. Phys.* **16** (2014) 123002-1 - 123002-15.
- ¶(44) H. Yamase and R. Zeyher  
 "Superconductivity from orbital nematic fluctuations"  
*Phys. Rev. B* **88** (2013) 180502(R)-1 - 180502(R)-5.
- ¶(43) H. Yamase and R. Zeyher  
 "Electronic Raman scattering from orbital nematic fluctuations"  
*Phys. Rev. B* **88** (2013) 125120-1 - 125120-11.

(42) H. Yamase

”Mean-field theory on a coupled system of ferromagnetism and electronic nematic order”  
Phys. Rev. B **87** (2013) 195117-1 - 195117-9.

¶(41) M. Bejas, A. Greco, and H. Yamase

”Possible charge instabilities in two-dimensional doped Mott insulators”  
Phys. Rev. B **86** (2012) 224509-1 - 224509-12.

¶(40) H. Yamase and W. Metzner

”Fermi-surface truncation from thermal nematic fluctuations”  
Phys. Rev. Lett. **108** (2012) 186405-1 - 186405-5.

(39) A. A. Katanin, H. Yamase, and V. Yu. Irkhin

”Ferromagnetic instability and finite-temperature properties of two-dimensional electron systems with van Hove singularities”

J. Phys. Soc. Jpn. **80** (2011) 063702-1 - 063702-4.

(38) H. Yamase, M. Yoneya, and K. Kuboki

”Multilayer cuprate superconductors as possible systems described by resonating-valence-bond and antiferromagnetic orders”

Phys. Rev. B **84** (2011) 014508-1 - 014508-5.

(37) H. Yamase, P. Jakubczyk, and W. Metzner

”Nematic quantum criticality without order”

Phys. Rev. B **83** (2011) 125121-1 - 125121-4.

¶(36) H. Yamase and R. Zeyher

”Raman scattering near a *d*-wave Pomeranchuk instability”

Phys. Rev. B **83** (2011) 115116-1 - 115116-11.

(35) H. Yamase and A. A. Katanin

”Addenda: van Hove singularity and spontaneous Fermi surface symmetry breaking in  $\text{Sr}_3\text{Ru}_2\text{O}_7$ ”

J. Phys. Soc. Jpn. **79** (2010) 127001.

¶(34) H. Yamase and P. Jakubczyk

”Singular nonordering susceptibility at a Pomeranchuk instability”

Phys. Rev. B **82** (2010) 155119-1 - 155119-5.

(33) H. Yamase

”Pomeranchuk instability as order competing with superconductivity”

Physica C **470** (2010) S109 - S110.

(32) K. Kuboki, M. Yoneya, and H. Yamase

”Coexistence of antiferromagnetism and *d*-wave superconductivity in extended *t-J* model”

Physica C **470** (2010) S163 - S164.

¶(31) P. Jakubczyk, W. Metzner, and H. Yamase

”Turning a first order quantum phase transition continuous by fluctuations: general flow equations and application to *d*-wave Pomeranchuk instability”

Phys. Rev. Lett. **103** (2009) 220602-1 - 220602-4.

(30) H. Yamase

”Spontaneous Fermi surface symmetry breaking in bilayer systems”

Phys. Rev. B **80** (2009) 115102-1 - 115102-7.

(29) W. Metzner, L. Dell’Anna, and H. Yamase

”Nematic order and non-Fermi liquid behavior from a Pomeranchuk instability in a two-dimensional electron system”

J. Phys.: Conference Series **150** (2009) 032058.

(28) P. A. Igoshev, A. A. Katanin, H. Yamase, and V. Yu. Irkhin

”Spin fluctuations and ferromagnetic order in two-dimensional itinerant systems with Van Hove singularities”

J. Magn. Magn. Mater. **321** (2009) 899-902.

¶(27) H. Yamase

”Self-masking of spontaneous symmetry breaking in layer materials”

Phys. Rev. Lett. **102** (2009) 116404-1 - 116404-4.

¶(26) H. Yamase

”Theory of reduced singlet pairing without the underlying state of charge stripes in the high-temperature superconductor  $\text{YBa}_2\text{Cu}_3\text{O}_{6.45}$ ”

Phys. Rev. B **79** (2009) 052501-1 - 052501-4.

(25) H. Yamase

”Cuprate superconductors in the vicinity of a Pomeranchuk instability”

J. Phys. Chem. Solids **69** (2008) 3297 - 3300.

(24) H. Yamase and A. A. Katanin

”Theory of spontaneous Fermi surface symmetry breaking in  $\text{Sr}_3\text{Ru}_2\text{O}_7$ ”

Physica B **403** (2008) 1262 - 1264.

¶(23) H. Yamase

”Effect of magnetic field on spontaneous Fermi surface symmetry breaking”

Phys. Rev. B **76** (2007) 155117-1 - 155117-11.

¶(22) H. Yamase and A. A. Katanin

”Van Hove singularity and spontaneous Fermi surface symmetry breaking in  $\text{Sr}_3\text{Ru}_2\text{O}_7$ ”

J. Phys. Soc. Jpn. **76** (2007) 073706-1 - 073706-5.

- (21) H. Yamase and W. Metzner  
 "Competition of Fermi surface symmetry breaking and superconductivity"  
 Phys. Rev. B **75** (2007) 155117-1 - 155117-6.
- (20) H. Yamase  
 "Magnetic excitations in La-based cuprate superconductors: Slave-boson mean-field analysis of the two-dimensional  $t$ - $J$  model"  
 Phys. Rev. B **75** (2007) 014514-1 - 014514-9.
- (19) H. Yamase and W. Metzner  
 "Theory of the in-plane anisotropy of magnetic excitations in  $\text{YBa}_2\text{Cu}_3\text{O}_{6+y}$ "  
 Physica C **460-462** (2007) 979-980.
- ¶(18) H. Yamase and W. Metzner  
 "Magnetic excitations and their anisotropy in  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ : Slave-boson mean-field analysis of the bilayer  $t$ - $J$  model"  
 Phys. Rev. B **73** (2006) 214517-1 - 214517-20.
- (17) A. Miyanaga and H. Yamase  
 "Orientational symmetry-breaking correlations in square lattice  $t$ - $J$  model"  
 Phys. Rev. B **73** (2006) 174513-1 - 174513-5.
- (16) H. Yamase, V. Oganesyan, and W. Metzner  
 "Spontaneous Fermi surface symmetry breaking on a square lattice"  
 Physica B **378-380** (2006) 139-141.
- ¶(15) H. Yamase, V. Oganesyan, and W. Metzner  
 "Mean-field theory for symmetry-breaking Fermi surface deformations on a square lattice"  
 Phys. Rev. B **72** (2005) 035114-1 - 035114-11.
- ¶(14) H. Yamase  
 "Excitation spectrum of  $d$ -wave Fermi surface deformation"  
 Phys. Rev. Lett. **93** (2004) 266404-1 - 266404-4.
- (13) H. Yamase and H. Kohno  
 "Coexistence of antiferromagnetism and  $d$ -wave singlet state controlled by long-range hopping integral"  
 Phys. Rev. B **69** (2004) 104526-1 - 104526-5.
- (12) H. Yamase and H. Kohno  
 "Competition and coexistence between Néel order and  $d$ -wave singlet RVB"  
 Physica C **408-410** (2004) 273-274.

- (11) H. Yamase and H. Kohno  
 "Shift of incommensurate antiferromagnetic peaks in  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ "  
*Phys. Rev. B* **68** (2003) 014502-1 - 014502-7.
- (10) H. Yamase and H. Kohno  
 "Effects of orthorhombic distortion on magnetic excitation in  $t-J$  model"  
*J. Low Temp. Phys.* **131** (2003) 251-255.
- (9) H. Yamase and H. Kohno  
 "Breakdown of Fourfold Symmetry of Fermi Surface and Magnetic Excitation Spectrum"  
*J. Phys. Chem. Solids* **63** (2002) 1393-1397.
- (8) H. Yamase  
 "Breakdown of Fourfold Symmetry in Diagonal Incommensurate Magnetic Peaks"  
*J. Phys. Soc. Jpn.* **71** (2002) 1154-1160.
- ¶(7) H. Yamase and H. Kohno  
 "Magnetic Excitation of  $t-J$  Model with Quasi-One-Dimensional Fermi Surface — Possible Relevance to LSCO Systems"  
*J. Phys. Soc. Jpn.* **70** (2001) 2733-2745.
- (6) H. Yamase and H. Kohno  
 "Quasi-One-Dimensional Band in the  $t-J$  Model"  
*Physica C* **341-348** (2000) 321-322.
- ¶(5) H. Yamase and H. Kohno  
 "Instability toward Formation of Quasi-One-Dimensional Fermi Surface in Two-Dimensional  $t-J$  Model"  
*J. Phys. Soc. Jpn.* **69** (2000) 2151-2157.
- (4) H. Yamase, H. Kohno, and H. Fukuyama  
 "Possible quasi-one-dimensional fermi surface in LSCO: phenomenological study"  
*Physica B* **284-288** (2000) 1375-1376.
- ¶(3) H. Yamase and H. Kohno  
 "Possible Quasi-One-Dimensional Fermi Surface in  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ "  
*J. Phys. Soc. Jpn.* **69** (2000) 332-335.
- (2) H. Yamase, H. Kohno, H. Fukuyama, and M. Ogata  
 "Incommensurate Antiferromagnetism Induced by Charge Density Modulation: Ginzburg-Landau Study"  
*J. Phys. Chem. Solids* **60** (1999) 1063-1065.

- (1) H. Yamase, H. Kohno, H. Fukuyama, and M. Ogata  
"Effects of Charge Density Modulation on Incommensurate Antiferromagnetism: Ginzburg-Landau Study"  
J. Phys. Soc. Jpn. **68** (1999) 1082-1085.

## Review in Japanese

¶(J6) H. Yamase and Y. Sakurai

“X-ray Compton scattering study of electronic states”  
BUTSURI **78** (2023) 4-12.

(J5) H. Yamase and Y. Sakurai

“X-ray Compton scattering reveals Fermi surfaces of electronic nematic liquid crystal in cuprate superconductors”  
Synchrotron Radiation **35** (2022) 338-347.

(J4) H. Yamase and Y. Sakurai

“Compton scattering for high-temperature superconductors: electron motions with a preferred direction”  
Isotope News **779** (2022) 38-41.

¶(J3) H. Yamase and K. Kuboki

“Spin susceptibility in magnetically ordered states”  
Kotai-Butsuri **53** (2018) 359-372.

(J2) H. Yamase

“Iron-based superconductors, Seven years laters (Japanese translation)”  
Parity **31**, No. 06 (2016) 4-13.

¶(J1) H. Yamase

“Symmetry breaking of Fermi surface”  
Kotai-Butsuri **42** (2007) 621-633.