

Full Name: Mohamed Abdelkareem Ali AHMED Kassem (Mohamed A. Kassem)

Nationality: Egyptian **Place of birth:** Assiut **Status:** Married

Date of Birth: 15.11.1982 **Phone:** (+2) 01062298768

Position and Affiliations:

Associate Professor, Department of Physics, Faculty of science, Assiut University, 71615 Asyut, Egypt

Research Field: Solid-State Physics, Materials Science and Engineering

E-mails: makassem@aun.edu.eg , m.akareem11@gmail.com

Webpage: [University member webpage](#)



EDUCATION:

(Jan 2017) **PhD**, Department of Materials Science and Engineering, Kyoto University, Japan
Thesis title: "Novel magnetic and electronic properties of kagomé-lattice cobalt-shandites"
Supervisor: Professor Dr. Hiroyuki Nakamura

(Jan 2011) **M. Sc.** Department of Physics, Assiut University, Egypt
Thesis title: "Physical properties of nanostructured NiO"
Supervisor: Professor Dr. Salah Makhoul

(Jun 2004) **B.Sc.** (Physics) Faculty of science, Assiut University, Egypt (Distinction with Honor)

ACADEMIC RECORD:

(Oct. 2022 – Sep. 2024) – *JSPS Postdoc (Fellow)*. Magnetism and Magnetic Materials Lab., Department of Materials Science and Engineering Kyoto University, Japan

(Jul 2019 – March 2022) – *Program-specific Researcher*. Magnetism and Magnetic Materials Lab., Department of Materials Science and Engineering Kyoto University, Japan

(Jun 2018 – Sep 2018) – Summer research visit. EP5, Center for Electronic Correlations and Magnetism, University of Augsburg, Germany

(Feb. 2017 ~ Jul 2019) – *Assistant professor and lecturer of* Solid-State and Materials Physics, Department of Physics, Assiut University, Egypt

(Oct 2012 – Sep 2016) – *PhD student* (scholarship). Magnetism and Magnetic Materials Lab., Kyoto University, Japan

(Nov 2004 – Oct 2012) – *Lecturer assistant and M. Sc. student* at Department of Physics, Faculty of science, Assiut University, Egypt

TEACHING COURSES BACHELOR B LEVEL AND (TEXT BOOKS)

- General Physics I-Mechanics and Heat _ B1, and, General Physics II-Electricity, magnetism and Optics_B1 (Physics for Scientists and Engineers 6th Ed by Serway and Jewett)
- Biophysics II-Heat therapy and Biomagnetism (Collected Notes, Introduction to Magnetic Resonance Imaging Techniques by Lars G. Hanson)
- Introduction to Solid-state Physics_B3 and B4, (Elementary Solid State Physics by Mohamed A. Omar, ADDISON-WESLEY, USA 1993); (Solid State Physics, 6th Ed, by S O Pillai, New Age International, India 2005); and, (Introduction to Solid State Physics 8th Ed by Charles Kittel, John Wiley & Sons, USA 2005)
- Introduction to Magnetism and Magnetic Materials_B4 and postgraduate students (Introduction to Magnetism and Magnetic Materials by B. Cullity, C. Graham, 2nd Ed, John Wiley & Sons, USA 2007); and (Magnetism and Magnetic Materials by J. M. D. Coey, Cambridge University Press, UK 2010)

- Magnetic Resonance: principles and Applications_B4 and postgraduate students (Magnetism and Magnetic Materials by J. M. D. Coey, Cambridge University Press, UK 2010, plus, Elementary Solid State Physics by Mohamed A. Omar, ADDISON-WESLEY, USA 1993)

RESEARCH INTERESTS:

- Fundamental **magnetism** of metals and compounds,
- Effects of **geometry in strongly-correlated-electron intermetallic compounds**
- Exploring **novel electronic and magnetic properties in frustrated** (triangular, kagome and pyrochlore) **magnets**,
- Development of **functional magnetic materials** (hosting of magnetic skyrmions, topological electronic state, soft magnetic properties, and rare-earth-free permanent magnets)
- Search for 2D and 'exfoliated' magnetic materials (van der Waals and kagome) with novel **quantum phenomena for energy harvesting applications**.
- Exploring the interplay between **topology and frustrated magnetism and related phenomena in quantum magnets for next-generation green technologies**.
- Materials science research aiming the **UN Sustainable Development Goals (SDGs) in relation to clean energy, economic growth, and innovation**.

RESEARCH EXPERIENCES AND SKILLS

- **Crystal growth** of intermetallic and semiconducting materials (by flux, Bridgman, CVT, Floating zone, and mono/tetra arc-melting methods), and **characterization** (XRD, SEM, TEM, WDX, EDX and crystal Laue x-ray)
- **Synthesis of hard and soft magnetic oxides** in single-domain nanocrystals form.
- **Magneto- and thermal transport measurements** (Magnetization, specific heat, conductance, magnetoresistance, and anomalous Hall, Seebeck and Nernst effects, etc.) by VSM, MPMS and PPMS (Quantum Design) and home-made circuits
- **NMR and Mossbauer measurement and analysis**.
- **ARPES and synchrotron radiation technology** (background)
- **Rietveld refinement of diffraction patterns**
- Band structure calculations (fair)

GRANTS & AWARDS:

- 1- JSPS Fellowship Award (Standard), Japan Society for Promotion of Science, (2022)
- 2- Best Research Award for Young Researchers in Basic and Applied Sciences, Assiut University, (2022)
- 3- Postdoctoral Fellowship Award, Cultural Affairs of Egypt Ministry of Scientific Research, (2019)
- 4- PhD scholarship Awards by MEXT (Japan) and Cultural Affairs Ministry of Scientific Research (Egypt), (2012)
- 5- Bachelor degree in Science excellence award, Assiut University, (2004)

RECEIPT OF COMPETITIVE RESEARCH FUNDS:

- 1- Grant-in-Aid for JSPS Fellows (Project Number 22KF0206); Single-year grant 2022 and Multi-year Fund 8 March 2023 - 31 March 2025; Synthesis of kagome magnets and exploration of emergent topological phenomena towards functionality; Co-Investigator
- 2- Mobility grant from Kyoto University (Japan) to Augsburg University (Germany) by DAAD-Kyoto University Partnership Programme towards SDGs; April 2021 - March 2022; From crystal

growth and exploration of topological phenomena towards functionality in kagomé magnets;
Principal Investigator

3- Financial Support by Elements Strategy Initiative Center for Magnetic Materials (ESICMM), National Institute of Materials (NIMS), Grant Number JPMXP0112101004, through the Ministry of Education, Culture, Sports, Science and Technology (MEXT); April 2020 - March 2022, Development of M-type Ferrites as Hard Magnetic Materials, Co-Investigator

4- Financial Support by Cultural Affairs of Egypt Ministry of Scientific Research for a Postdoctoral research in Kyoto University; July 2019 - March 2020; Development of Hard Magnetic Materials as Permanent Magnets, Principal Investigator

5- Grants numbers 1-06/2017, 1-06/2019; Research support unit of Faculty of Science, Assiut University; Single-domain spinel ferrite nanoparticles with soft magnetic order for high-frequency power applications, Principal Investigator.

CO-SUPERVISION

- *Doctoral:* Azza Mohamed Hassan Ali, (March 2018 – July 2021), thesis title: "Structural and Magnetic Properties of Some Nanostructured Spinel Ferrites Synthesized by Microwave-induced Combustion Method", Department of Physics, Faculty of science, Assiut University, Egypt
- *Doctoral:* Ahmed Mohamed Nashaat, (March 2022 – Jan. 2025) Joint supervision between Assiut University (Egypt) and Kyoto University (Japan) for a PhD in Materials Physics, thesis title: "Structural and Magnetic Studies on Spinel and Magnetoplumbite Materials for Energy Applications"
- *Master:* Yusuke Segawa, M.Sc. in Materials Science and Engineering (March 2023 – March 2025) Thesis work 'Magnetism of Re-Mo-based lacunar spinel compounds' Department of Materials Science and Engineering, Kyoto University (Japan)
- 4- *Bachelor:* Kazushi Midori, B.SC. in Materials Science and Engineering (March 2023) Graduation Project 'A new double-layered kagome antiferromagnet ScFe_6Ge_4 ' Department of Materials Science and Engineering, Kyoto University (Japan)
- 5- *Bachelor:* Masahiro Tsutsui, B.SC. in Materials Science and Engineering (March 2022) Graduation Project 'Magnetic properties of YMn_2 ' Department of Materials Science and Engineering, Kyoto University (Japan)

REVIEWS FOR INTERNATINAL JOURNALS

Applied Physics Letters, New Journal of Physics, Journal of Alloys and Compounds, Journal of Materials Chemistry C, Next materials, Nanoscale, Journal of Nanostructure in Chemistry,...etc.

MEMBERSHIP

The Physical Society of Japan, Egypt Scientific Academy of Science

ORGANIZATION OF SCIENTIFIC EVENTS:

2. 6th International Conference for Young Scientists in Basic and Applied Sciences, ICYS-BAS, by Faculty of Science Assiut Univ., in 27 – 30 Mar 2019 in Hurghada, Egypt (Co-organizer)
1. Joint workshop, "Materials Science and Engineering: Applications and Fabrication", (26 Jun 2017) in Faculty of Science, Assiut University, Egypt (Organizer)

Articles:

28. F. Schilberth, M.-C. Jiang, F. Le Mardelé, L. B. Papp, I. Mohelsky, M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura, G.-Y. Guo, M. Orlita, R. Arita, I. Kézsmárki, S. Bordács, "Generation of Weyl points and a nodal line by magnetization reorientation in $\text{Co}_3\text{Sn}_2\text{S}_2$ ", [npj Quantum Mater. 10, 67 \(2025\)](#)
27. Mohamed A. Kassem, T. Shiotani, H. Ohta, Y. Tabata, T. Waki, H. Nakamura, "A new double-layered kagome antiferromagnet ScFe_6G_4 " [Solid state Commun. 385, 115513 \(2024\)](#)
26. M. A. Kassem, AA El-Fadl, AM Nashaat, H Nakamura, "Structural, Optical and Single-domain Magnetic Features of the Noncollinear Ferrimagnetic Nano-spinel Chromites ACrO ($\text{A} = \text{Ni}, \text{Co}, \text{and Mn}$), [Chem Matter 2024](#) (Under Review)
25. A. M. Nashaat, M. A. Kassem, A. A. El-Fadl, H. Nakamura, "Low-temperature cluster spin glass transition in the single-domain NiCr_2O_4 nanoparticles" [Nanotechnology 35, 195702 \(2024\)](#)
24. I Živković, M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura, "Doping Dependence of the in-Plane Transition in $\text{Co}_3\text{Sn}_2\text{S}_2$ " [J. Phys. Soc. Jpn. 92, 095001 \(2023\)](#)
23. F. Schilberth, M.-C. Jiang, S. Minami, M. A. Kassem, F. Mayr, T. Koretsune, Y. Tabata, T. Waki, H. Nakamura, G.-Y. Guo, R. Arita, I. Kézsmárki, S. Bordács "Nodal-line resonance generating the giant anomalous Hall effect of $\text{Co}_3\text{Sn}_2\text{S}_2$ " [Phys. Rev. B 107, 214441 \(2023\)](#)
22. M. Althaler, E. Lysne, E. Roede, L. Prodan, V. Tsurkan, M. A. Kassem, H. Nakamura, S. Krohns, I. Kézsmárki, and D. Meier, "Magnetic and geometric control of spin textures in the itinerant kagome magnet Fe_3Sn_2 " [Phys. Rev. Research 3, 043191 \(2021\)](#)
21. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Unconventional critical behaviors at the magnetic phase transition of $\text{Co}_3\text{Sn}_2\text{S}_2$ kagomé ferromagnet" [J. Phys.: Condens. Matter 33, 015801 \(2020\)](#)
20. A. Sugawara, T. Akashi, M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Magnetic domain structure within half-metallic ferromagnetic kagome compound $\text{Co}_3\text{Sn}_2\text{S}_2$ " [Phys. Rev. Mater. 3 104421 \(2019\)](#)
19. Mohamed A. Kassem, Yoshikazu Tabata, Takeshi Waki and Hiroyuki Nakamura, "Low-field anomalous magnetic phase in the kagome-lattice shandite $\text{Co}_3\text{Sn}_2\text{S}_2$ " [Phys. Rev. B 96, 014429 \(2017\)](#)
18. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura "Quasi-two-dimensional magnetism in Co-based shandites", [J. Phys. Soc. Jpn. 85, 064706 \(2016\)](#)
17. A. Abu El-Fadl, M. A. Kassem, A. M. Nashaat, "Synthesis, optical and magnetic characterization of spinel-type $\text{Cd}_{1-x}\text{Co}_x\text{Cr}_2\text{O}_4$ nanocrystals, [Mater. Res. Express 6, 1150a7 \(2019\)](#)
16. M Mohamed, A Sedky, MA Kassem, "Gradual growth of ZnO nanoparticles from globules-like to nanorods-like shapes: Effect of annealing temperature" [Optik 265, 169559 \(2022\)](#)
15. Mohamed A. Kassem, "Novel magnetic and electronic properties of kagomé-lattice cobalt-shandites", PhD thesis [Kyoto University \(2017\)](#)
14. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Drastic effect of the Mn-substitution in the strongly correlated semiconductor FeSb_2 " [J. Phys.: Conf. Ser. 868, 012019 \(2017\)](#)
13. Mohamed A. Kassem, Yoshikazu Tabata, Takeshi Waki, Hiroyuki Nakamura, Crystal growth and metallic ferromagnetism induced by electron doping in FeSb_2 , (2021) submitted [arXiv:2011.10343](#)
12. A. M. Nashaat, A. A. El-Fadl, M. A. Kassem, H. Nakamura, "Optimizing a microwave-combustion synthesis and particle-size dependent magnetic properties of M-type Sr ferrite", [Mater. Chem. Phys. 305, 128008 \(2023\)](#)
11. A.M. Nashaat, A.A. El-Fad, H. Nakamura, M.A. Kassem "Glassy magnetic freezing and exchange bias effect in $\text{NiCo}_2\text{O}_4/(\text{Co-Ni})\text{O}$ nanoparticles composite", [J. Magn. Magn. Mater. 567, 170366 \(2023\)](#).
10. M. A. Kassem, T. Waki, Y. Tabata, H. Nakamura, "Bismuth substitution at the strontium site in the magnetoplumbite-type Sr ferrite: Phase stability, structure, and magnetic properties" [J. Magn. Magn. Mater. 560, 169603 \(2022\)](#).
9. Mohamed A. Kassem, A. Abu El-Fadl, A. M. Hassan, A.M. Gismelssed, H. Nakamura, "Structure and cationic distribution dependent soft magnetic properties of single-domain $\text{Mg}_{1-x}\text{Ni}_x\text{Fe}_2\text{O}_4$ ($0 \leq x \leq 1.0$) nanocrystals" [Mater. Sci. Eng. B 274, 115494 \(2021\)](#)

8. A. Abu El-Fadl, A. M. Hassan and Mohamed A Kassem, "Tunable cationic distribution and structure-related magnetic and optical properties by Cr³⁺ substitution for Zn²⁺ in nanocrystalline Ni-Zn ferrites", [Results Phys., 28, 104622 \(2021\)](#)
7. M. A. Kassem, A. Abu El-Fadl, A. M. Nashaat, H. Nakamura, "Magnetic Evolution from the superparamagnetism in Nanospinel Chromites Cd_{1-x}Co_xCr₂O₄ (0 ≤ x ≤ 1.0)" [J. Magn. Magn. Mater. 495, 1658302 \(2020\)](#)
6. A. Abu El-Fadl, A. M. Hassan and M. A. Kassem, "Structural and spectroscopic studies of nanocrystalline Ni_{1-x}Mg_xFe₂O₄ ferrites synthesized by a microwave-assisted combustion route" [Phys. Scr. 95, 055813 \(2020\)](#)
5. M. A. Kassem, A. Abu El-Fadl, A. M. Nashaat, H. Nakamura, "Structure, optical and varying magnetic properties of insulating MCr₂O₄ (M= Co, Zn, Mg and Cd) nanospinels" [J. Alloy. Comp. 790, 853 \(2019\)](#)
4. A. E. Said, M. N. Goda, M. A. Kassem, "Promotional Effect of B₂O₃, WO₃ and ZrO₂ on the Structural, Textural and Catalytic Properties of FePO₄ Catalyst Towards the Selective Dehydration of Methanol into Dimethyl Ether" [Catalysis Letters 150, 1714–1728 \(2020\)](#)
3. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura "Single crystal growth and magnetism of the kagomé-lattice Co-shandite" [J. Low Temp. and Mater. Sci. 31, 9 \(2017\)](#)
2. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Structure and Magnetic Properties of Flux Grown Single Crystals of Co_{3-x}Fe_xSn₂S₂ Shandites" [J. Solid State Chem. 233, 8 \(2016\)](#)
1. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Single Crystal Growth and Characterization of Kagomé-lattice Shandites Co₃Sn_{2-x}In_xS₂" [J. Crystal Growth 426, 208 \(2015\)](#)

Conferences:

14. M. A. Kassem, Z. Midori, T. Waki, Y. Tabata, H. Nakamura "A New Double-layered Kagome Antiferromagnet ScFe₆Ge₄" (**Poster 2023**), the 31st International Conference on Strongly Correlated Electron Systems 2023 (**SCES 2023**), **Incheon, Korea July 2-7, 2023**
13. M. A. Kassem, T. Waki, Y. Tabata, H. Nakamura "Phase stability and magnetocrystalline anisotropy of Bi- and Bi-Co substituted M-type Sr ferrites as a rare-earth-free permanent magnet" (**Poster 2021**) 26th International Workshop on Rare Earth and Future Permanent Magnets and Their Applications (**REPM2020**) **virtually on June 7-10, 2021**
12. M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura "Magnetocaloric Effect and Investigation of Magnetic Transitions in Co₃M₂S₂ (M = Sn, In) Kagome-Ferromagnets" (**Oral 2019**) **14th APPC, Kuching, Malaysia**
11. M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura "Magnetocaloric effect and critical phenomena in Co₃Sn₂S₂", (**oral 2019**) **6th ICYS-BAS, Hurghada, Egypt**
10. M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura, S. Bordács and I. Kézsmárki "Magnetic Phase Diagrams of Skyrmions-hosting Kagomé Magnets: Fe₃Sn₂ and Co₃Sn₂S₂" (**Oral 2018**) **NTCM, Lausanne, Switzerland**
9. A. Sugawara, T. Akashi, M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Magnetic domain structure within kagomé-compound Co₃Sn₂S₂" (**poster 2018**), **ICM, San Francisco, USA**
8. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura "Thermoelectric performance and anisotropic electronic transport in Co₃Sn_{2-x}In_xS₂ single crystals" (**Oral 2018**) **ICMSE-RAC, Alexandria, Egypt**
7. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura "Low-field anomalous magnetic phase in the kagomé-lattice Co₃(Sn-In)₂S₂ ferromagnets" (**Oral 2017**) **ICPMSE, Luxor, Egypt**
6. M. A. Kassem, K. Itou, Y. Tabata, T. Waki and H. Nakamura, "Topological Hall effect in an itinerant-electron kagomé ferromagnet" (**poster 2016**) **HFM, Taipei, Taiwan**
5. M. A. Kassem, K. Itou, Y. Tabata, T. Waki, C. Michioka, K. Yoshimura and H. Nakamura, "Emergent chiral spin structure and unconventional electronic states in the stacked-kagomé-layered Co₃Sn_{2-x}In_xS₂ shandites." (**oral 2016**) **SPSSM, Nantes, France**
4. M. A. Kassem, Y. Tabata, T. Waki, C. Michioka, K. Yoshimura and H. Nakamura, "Anomalous quasi-two-dimensional electronic state in Co₃Sn_{2-x}In_xS₂ shandites" (**poster 2016**) **LEES, Shiga, Japan**
3. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Drastic effect of the hole doping in the strongly correlated semiconductor FeSb₂" (**poster 2015**) **IWIEM, Kyoto, Japan**
2. K. Itou, M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura, "Anomalous Hall effect in kagomé lattice magnet Co₃Sn_{2-x}In_xS₂" (**oral 2015**) **JPS meeting, Japan**
1. Mohamed A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Crystal Structure and Anisotropic Properties of Flux Grown Co₃Sn_{2-x}In_xS₂ Shandites" (**poster 2015**) **NASSCC, Tallahassee, USA**

REFERENCES:

- **Hiroyuki Nakamura (Professor, Dr. Sc.)**, E-Mail : nakamura.hiroyuki.2w@kyoto-u.ac.jp
Department of Materials Science and Engineering, Graduate School of Engineering,
Kyoto University, Yoshida Honmachi, Sakyo-ku, Kyoto, 606-8501, Japan
- **István Kézsmárki (Professor, Dr.)**, E-Mail: istvan.kezsmarki@physik.uni-augsburg.de,
EP 5, Center for Electronic Correlations and Magnetism, University of Augsburg,
Germany
- **Ahmed Ali Ebrahim (Professor, Dr.)**, E-Mail: aebrahim@aun.edu.eg , Head of
Department of Physics, Faculty of Science, Assiut University, Assiut 71516, Egypt.
- **Abdel-Hamid Abu-Sehly (Professor, Dr.)**, E-Mail: a.abushaly@aun.edu.eg, Dean of Faculty
of science, Assiut University, Assiut 71516, Egypt.

Mohamed Abdelkareem Ali Kassem (PhD),
November 2025