

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

Nationality: Egyptian

Place of birth: Assiut

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Position and Affiliation in Egypt:

Lecturer, Department of Physics, Assiut University, Assiut 71516, Egypt

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

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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"

(Jan 2011) **M. Sc.** (Experimental Solid-State Physics) Department of Physics, Assiut University, Egypt

Thesis title: "Physical properties of nanostructured NiO"

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

ACADEMIC RECORD:

(Jan 2020 – now) – *Program-specific Researcher*. Magnetism and Magnetic Materials Lab., Department of Materials Science and Engineering Kyoto University, Japan

(Jul 2019 – Jan 2020) – *Postdoc (Fellow)*. Magnetism and Magnetic Materials Lab., Department of Materials Science and Engineering Kyoto University, Japan.

(March 2017 – now) – *Lecturer and Researcher* (on leave for postdoc intervals). Department of Physics, Assiut University, Egypt

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

(Dec 2016 - Feb 2017) – *Researcher*. Magnetism and Magnetic Materials Lab., Kyoto University, Japan

(Oct 2012 - Dec 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

GRANTS & AWARDS:

(2021) Mobility grant from Kyoto University (Japan) to Augsburg University (Germany) by DAAD-Kyoto University Partnership Programme towards SDGs

(2020) Program-specific fellowship at Kyoto University funded by MEXT (Project for development of novel high-performance permanent magnets).

(2019) Postdoc fellowship (6 months) by Cultural Affairs of Egypt Ministry of Scientific Research.

(2018) Summer host (3 months) EP5, Center for Electronic Correlations and Magnetism, University of Augsburg, Germany.

(2012) PhD scholarship (4 years) by Cultural Affairs of Egypt Ministry of Scientific Research.

(2004) Bachelor's degree excellence award (Assiut University, Egypt)

SUPERVISION

1- Azza Mohamed Hassan Ali, "Structural and Magnetic Properties of Some Nanostructured Spinel Ferrites Synthesized by Microwave-induced Combustion Method", finished 2021-07-18

Supervisors: Prof. Dr. Abdel-Aziz Abu-Elfadl Abdel-Aziz (Department Faculty of Science Assiut University), Prof. Dr. Mamdouh Abd Elaal Ahmed (Faculty of Science, Al-Azhar University Cairo), and Dr. Mohamed Abdelkareem Ali Kassem (Physics Department Faculty of Science Assiut University)

2- Ahmed Mohamed Nashaat, "Structural and Magnetic Studies on Spinel and Magnetoplumbite Materials for Energy Applications", Continued

Supervisors: Prof. Dr. Abdel-Aziz Abu-Elfadl Abdel-Aziz (Assiut University), Dr. Mohamed Abdelkareem Ali Kassem (Assiut University), and Prof. Dr. Hiroyuki Nakamura (Kyoto University, Kyoto, Japan)

EXPERIENCES AND RESEARCH INTERESTS:

- Crystal growth of intermetallic compounds, Kondo insulators and metal oxides by flux, Bridgman, CVT, Floating zone, and Arc-melting methods.
- Magnetization, magnetoresistance and anomalous Hall effect measurements by MPMS and PPMS (Quantum Design),
- Exploring topological phenomena and Magnetic skyrmions in frustrated (triangular, kagome and pyrochlore) magnets for spintronics application,
- The interplay between topology and magnetism in quantum magnets for dissipationless and high-capacity memory devices and next-generation green technologies.
- Synthesis of single-domain spinel ferrite nanoparticles with soft magnetic order for high-frequency power applications (high-density data storage, magnetic drug delivery, transformers, microwave devices).
- Development of rare-earth-free hexaferrites toward new-generation permanent magnets with low cost, chemical stability, and competitive performance.
- Materials science research that contributes to the UN Sustainable Development Goals (SDGs) in relation to clean energy, economic growth, and innovation.

REVIEWS FOR JOURNALS

Journal of Materials Chemistry C; Journal of Alloys and Compounds; New Journal of Physics, Applied Physics Letters.

MEMBERSHIP

The Physical Society of Japan

EVENTS AND ORGANIZATION:

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

LIST OF PUBLICATIONS:

Articles

23. Mohamed A. Kassem, Takeshi Waki, Yoshikazu Tabata, Hiroyuki 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)
22. M. Mohamed, A Sedky, M. A. Kassem, "Gradual growth of ZnO nanoparticles from globules-like to nanorods-like shapes: Effect of annealing temperature", Optik **265**, 169559 (2022)
21. Mohamed A. Kassem, Yoshikazu Tabata, Takeshi Waki, Hiroyuki Nakamura, Crystal growth and metallic ferromagnetism induced by electron doping in FeSb₂, (2021) submitted [arXiv:2011.10343](https://arxiv.org/abs/2011.10343)

20. M. Althaler, E. Lysne, E. Roede, L. Prodan, V. Tsurkan, Mohamed 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 \(2021\)](#)
19. 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 \(2021\)](#)
18. A. Abu El-Fadl, A. M. Hassan and Mohamed A Kassem, "Tunable cationic distribution and structure-related magnetic and optical properties by Cr^{3+} substitution for Zn^{2+} in nanocrystalline Ni-Zn ferrites", [Results Phys., 28, 104622 \(2021\)](#)
17. 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 \(2020\) 015801](#)
16. M. A. Kassem, A. Abu El-Fadl, A. M. Nashaat, H. Nakamura, "Magnetic Evolution from the superparamagnetism in Nanospinel Chromites $\text{Cd}_{1-x}\text{Co}_x\text{Cr}_2\text{O}_4$ ($0 \leq x \leq 1.0$)" [J. Magn. Magn. Mater. 495 \(2020\) 1658302](#)
15. A. Abu El-Fadl, A. M. Hassan and M. A Kassem, "Structural and spectroscopic studies of nanocrystalline $\text{Ni}_{1-x}\text{Mg}_x\text{Fe}_2\text{O}_4$ ferrites synthesized by a microwave-assisted combustion route" [Phys. Scr. 95 \(2020\) 055813](#)
14. A. A. Said, M. N. Goda, M. A. Kassem "Promotional Effect of B_2O_3 , WO_3 and ZrO_2 on the Structural, Textural and Catalytic Properties of FePO_4 Catalyst Towards the Selective Dehydration of Methanol into Dimethyl Ether" [Catal. Lett. 150 \(2020\) 1714](#)
13. 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 \(2019\)104421](#)
12. M. A. Kassem, A. Abu El-Fadl, A. M. Nashaat, H. Nakamura, "Structure, optical and varying magnetic properties of insulating MCr_2O_4 ($\text{M} = \text{Co}, \text{Zn}, \text{Mg}$ and Cd) nanospinels" [J. Alloy. Comp. 790 \(2019\) 853](#)
11. 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 \(2019\) 1150a7](#)
10. 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 \(2017\) 014429](#)
9. Mohamed A. Kassem, "Novel magnetic and electronic properties of kagomé-lattice cobalt-shandites", [Kyoto University](#) (2017)
8. 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 \(2017\) 012019](#)
7. 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 \(2017\) 9](#)
6. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura "Quasi-two-dimensional magnetism in Co-based shandites", [J. Phys. Soc. Jpn. 85 \(2016\) 064706](#)
5. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Structure and Magnetic Properties of Flux Grown Single Crystals of $\text{Co}_{3-x}\text{Fe}_x\text{Sn}_2\text{S}_2$ Shandites" [J. Solid State Chem. 233 \(2016\) 8](#)
4. A. Nasser, M. A Kassem, A. Elsayed, M. A. Gepreel and A. A. Moniem "Influence of Grain Refinement on Microstructure and Mechanical Properties of Tungsten Carbide/Zirconia Nanocomposites" [J. Mater. Eng. Perform. 25 \(2016\) 5065](#)
3. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Single Crystal Growth and Characterization of Kagomé-lattice Shandites $\text{Co}_3\text{Sn}_{2-x}\text{In}_x\text{S}_2$ " [J. Crystal Growth 426 \(2015\) 208](#)
2. S. A. Makhlof, M. A. Kassem and M. A. Abdel-Rahim, "Crystallite size dependent optical properties of nanostructured NiO films", [J. Optoelectron. Adv. Mater. 4 \(2010\) 1562](#)
1. S. A. Makhlof, M. A. Kassem and M. A. Abdel-Rahim, "Particle size-dependent electrical properties of nanocrystalline NiO ", [Journal of Materials Science 44 \(2009\) 3438](#)

Conferences

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 $\text{Co}_3\text{M}_2\text{S}_2$ (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 $\text{Co}_3\text{Sn}_2\text{S}_2$ ", (**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: Fe_3Sn_2 and $\text{Co}_3\text{Sn}_2\text{S}_2$ " (**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 $\text{Co}_3\text{Sn}_2\text{S}_2$ " (**poster** 2018), **ICM, San Francisco, USA**
8. M. A. Kassem, Y. Tabata, T. Waki and H. Nakamura "Thermoelectric performance and anisotropic electronic transport in $\text{Co}_3\text{Sn}_{2-x}\text{In}_x\text{S}_2$ 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 $\text{Co}_3(\text{Sn-In})_2\text{S}_2$ 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 $\text{Co}_3\text{Sn}_{2-x}\text{In}_x\text{S}_2$ 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 $\text{Co}_3\text{Sn}_{2-x}\text{In}_x\text{S}_2$ 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 FeSb_2 " (**poster** 2015) **IWIEM, Kyoto, Japan**
2. K. Itou, M. A. Kassem, Y. Tabata, T. Waki, H. Nakamura, "Anomalous Hall effect in kagomé lattice magnet $\text{Co}_3\text{Sn}_{2-x}\text{In}_x\text{S}_2$ " (**oral** 2015) **JPS meeting, Japan**
1. Mohamed A. Kassem, Y. Tabata, T. Waki and H. Nakamura, "Crystal Structure and Anisotropic Properties of Flux Grown $\text{Co}_3\text{Sn}_{2-x}\text{In}_x\text{S}_2$ Shandites" (**poster** 2015) **NASSCC, Tallahassee, USA**

REFERENCES:

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- **Abdulaziz Abu El-Fadl (Professor, Dr.)**, Email: abuelfadl@aun.edu.eg, Department of Physics, Faculty of Science, Assiut University, Assiut 71516, Egypt.
- **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
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Mohamed A. Kassem (Dr.),
July 2022