Prof. Dr. Waleed M. Moslem

Professor of Theoretical Plasma Physics

Centre for Theoretical Physics, The British University in Egypt, Cairo, Egypt (*current affiliation*)
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Professional Summary

Physicist with 25+ years of experience in, e.g., plasma physics, nonlinear wave dynamics, and space plasma interactions. Proven record of competitive grants, high-impact publications, international collaborations, editorial service, and supervision of MSc/PhD students. Experienced in leading multi-institutional projects and delivering advanced graduate teaching.

Key Metrics

- Publications: **190+** refereed articles | h-index: **41** | Citations: **5000+** (WOS & Scopus).
- h-index: **46** | Citations: **6000+** | i_{10}-index: 121 | i_{100}-index: 11 (Google Scholar).
- Supervision: **40+** MSc/PhD graduates; **15+** current supervisees.
- Grants: **7+** funded projects as PI/Co-PI (national and international).
- Invited talks: **25+** at conferences, workshops, and colloquia.

Research Interests

Theoretical plasma physics (classical, quantum, and dusty plasmas); nonlinear dynamics, soliton theory, and wave–wave interactions (KdV, KP, ZK, NLS). Linear and nonlinear plasma waves and instabilities: ion-acoustic, dust-acoustic, Alfvén, drift, whistler, and rogue waves. Space and astrophysical plasmas: solar wind–planet interactions (Venus, Mars, Jupiter, Saturn, Titan), plasma expansion, and wakefield effects. Plasmonics and surface plasma waves; laser–plasma interactions; electron–hole semiconductor plasmas. Ion-induced plasma expansion and wake potentials leading to surface nanostructuring in functional materials.

Academic Appointments

Full Professor
Centre for Theoretical Physics, The British University in Egypt. *2014–present*

Full Professor
Department of Physics, Port Said University, Port Said, Egypt. *2013–present*

Associate Professor
Department of Physics, Port Said University, Port Said, Egypt. *2010–2013*

Lecturer
Department of Physics, Suez Canal University, Port Said, Egypt. *2002–2010*

Education

Ph.D. in Physics — *PhD 2002*
Mansoura University, Mansoura, Egypt. Thesis: *Study of the propagation of the dust acoustic waves in a dusty plasma.* Supervisors: S. K. El-Labany & S. Mustafa.

M.Sc. in Physics — *MSc 1998*
Mansoura University, Mansoura, Egypt. Thesis: *Study of the propagation of the cylindrical ion acoustic waves in plasma.* Supervisors: S. K. El-Labany & S. A. El-Warraki.

B.Sc. in Physics and Chemistry — *BSc 1994*
Mansoura University, Mansoura, Egypt.

Research Funding (Selected)

PI, Electrostatic Waves in Plasma around Venus Ionosphere — *2021–2022*
Academy of Scientific Research and Technology & Port Said University (Project No. 6659). Role: PI. Co-PIs: Prof. Dr. Salah K. El-Labany, Dr. Alaa A. Fayad.

Consultant, Materials Modifications Using Ion Beam Technology — *2020–2022*
King Fahd University of Petroleum & Minerals, KSA (Project No. DF191053). PI: Prof. Dr. Ayman Sherif El-Said. Co-PI: Prof. Dr. Hocine Bahlouli.

PI, Solar Wind Impact, Ion Escape, and Wave Characteristics of High-Altitude Plasma Layers of Venus — *2020–2021*
Alexander von Humboldt Foundation, Germany. Co-PIs: PD Dr. Horst Fichtner, Prof. Dr. Marian Lazar.

Consultant, Surface Nanostructuring by High Density Electronic Excitations — *2017–2020*
King Fahd University of Petroleum & Minerals, KSA (Project No. RG161004). PI: Prof. Dr. Ayman Sherif El-Said. Co-PI: Prof. Dr. Hocine Bahlouli. Consultants: Prof. Dr. Waleed Moslem Moslem, Dr. Stefan Facsko.

Fellowships & Research Visits (Selected)

Post-doctoral Fellowship — *2025 (Jul–Sep)*
Alexander von Humboldt Foundation, Bonn, Germany. Institute of Physics IV, Faculty of Physics and Astronomy, Ruhr-University Bochum, Germany. Host: PD Dr. Horst Fichtner. Title: *Solar Wind-Induced Ionic Escape from the Martian Upper Atmosphere: A Hydrodynamic Perspective.*

Research Visit Fellowship — *2022 (Aug–Oct)*
Alexander von Humboldt Foundation, Bonn, Germany. Institute of Physics IV, Faculty of Physics and Astronomy, Ruhr-University Bochum, Germany. Host: PD Dr. Horst Fichtner. Title: *Solar Wind Impact, Ion Escape, and Wave Characteristics of the High-Altitude Plasma Layers of Venus.*

Post-doctoral Fellowship
Arab Fund for Economic and Social Development (Kuwait). International Centre for Advanced Studies in Physical Sciences, Faculty of Physics and Astronomy, Ruhr-University Bochum, Germany. Host: Prof. Dr. Padma Kant Shukla. Title: *Plasmonics: The Promise of the Future Nanoelectronics.* *2011–2012*

Post-doctoral Fellowship
Alexander von Humboldt Foundation, Bonn, Germany. Institute of Physics IV, Faculty of Physics and Astronomy, Ruhr-University Bochum, Germany. Host: Prof. Dr. Reinhard Schlickeiser. Title: *Investigation of Active Galactic Nuclei Using an Electron–Positron Plasma Model.* *2006–2008*

Publications (Selected)

- Gamal, A., Moslem, W. M., Shaaban, S. M., Yousef, M. S., Ellithi, A. Y., Elkamash, I. S. *Ion escape dynamics in the Martian upper ionosphere: A self-similar plasma expansion approach. Monthly Notices of the Royal Astronomical Society* **548**, 1–8 (2026).
- Elkamash, I. S., Moslem, W. M., Heller, R., Facsko, S., Wilhelm, R. A., Aumayr, F., El-Said, A. S. *Surface nanocratering by localized plasma expansion induced by slow highly charged ions. Physical Review E* **113**, 035502 (2026).
- El-Bedwehy, N. A., Sabry, R., Moslem, W. M., Elkamash, I. S. *Peregrine soliton and Akhmediev breather in superthermal multi-ion plasmas and their role in ion-induced nanostructuring. Physica D: Nonlinear Phenomena* **485**, 135027 (2026).
- Moslem, W. M., Sabry, R., Fichtner, H., Lazar, M., El-Shafeay, N. A. *Titan's wakefield effects due to solar wind streaming. Astronomy & Astrophysics* **701**, A106 (2025).
- Salem, S., Moslem, W. M., Fichtner, H., Lazar, M. *Solar wind effects on multi-fluid plasma expansion in the Venusian upper ionosphere. Astronomy & Astrophysics* **685**, A152 (2024).
- Morsi, S. A., Fayad, A. A., Tolba, R. E., Fichtner, H., Lazar, M., Moslem, W. M. *Propagation of nonlinear ion-acoustic fluctuations in the mantle of Venus. Astronomy & Astrophysics* **685**, A17 (2024).
- Fayad, A. A., Moslem, W. M., Fichtner, H., Lazar, M. *Linear and nonlinear kinetic Alfvén waves at Venus. Astronomy & Astrophysics* **675**, A192 (2023).
- Salem, S., Fayad, A. A., El-Shafeay, N. A., Sayed, F. S. H., Shihab, M., Fichtner, H., Lazar, M., Moslem, W. M. *Effect of the solar wind on arbitrary-amplitude ion-acoustic solitons in Venus' upper ionosphere. Monthly Notices of the Royal Astronomical Society* **517**, 2876–2886 (2022).
- El-Said, A. S., Moslem, W. M., Djebli, M. *Surface nanostructuring by ion-induced localized plasma expansion in zinc oxide. Applied Physics Letters* **104**, 231609 (2014).
- Saleem, H., Moslem, W. M., Shukla, P. K. *Solar wind interactions with the dusty magnetosphere of Jupiter: shocks and solitons associated with nonlinear drift waves. Journal of Geophysical Research: Space Physics* **117**, A08220 (2012).
- Zeba, I., Moslem, W. M., Shukla, P. K. *Ion solitary pulses in warm plasmas with ultrarelativistic degenerate electrons and positrons. The Astrophysical Journal* **750**, 72 (2012).
- Moslem, W. M., Sabry, R., El-Labany, S. K., Shukla, P. K. *Dust-acoustic rogue waves in a nonextensive plasma. Physical Review E* **84**, 066402 (2011).

Teaching & Supervision

Plasma Physics; Nonlinear Dynamics; Mathematical Methods
MSc/PhD level; curriculum development and assessment leadership. *Graduate Courses*

41 completed MSc/PhD (2002–2026); 15+ current
Primary supervisor/co-supervisor across multiple institutions. *Supervision*

Leadership & Academic Service

Editorial Board Member
Physica Scripta, Institute of Physics (IOP), UK, endorsed by the Royal Swedish Academy of Sciences. *2022–2026*

Editorial Board Member
Scientific African, Elsevier. *2020–2021*

Editorial Board Member
Alfarama Journal of Basic & Applied Sciences, Port Said University. *2019–Present*

Advisory Panel Member
Physica Scripta, Institute of Physics (IOP), UK, endorsed by the Royal Swedish Academy of Sciences. *2019–2021*

50+ journals
e.g., PRE; MNRAS; ApJ; JGR; Phys. Plasmas; J. Plasma Phys.; Phys. Lett. A, Icarus; Phys. Fluids, etc. *Peer Review*

PhD/MSc examiner
10+ universities in Egypt and Algeria. *Examination*

Founder & Chair, EGYPlasma Society, Egypt *2013–Present*

- Established the first society in Egypt dedicated to plasma physics education and outreach.
- Organized 11 Plasma Schools, 6 one-day Plasma Conferences, 6 Plasma Basic Courses, 2 Advanced Plasma Courses, and 4 Workshops.
- Alumni of the training schools, including my MSc students, have successfully enrolled in competitive PhD programs in the USA and Canada, obtained an AvH fellowship in Germany, and many other participants have progressed to master's and doctoral programs across Europe.

Collaborations & Outreach

- International collaborations with USTHB (Algeria), KFUPM & PNU (KSA), Ruhr University Bochum (Germany), KU Leuven (Belgium), etc.
- Public engagement: public lectures on space plasma and plasma technology; media interviews; STEM outreach to schools.

Honors & Distinctions

Awards

- **University Merit Award**, 2025 — Port Said University, Egypt.
- **Highest Citation Award**, 2023 — Port Said University, Egypt.
- **Dr. Fayza Elkhrafy Award in Physics**, 2015 (for 2014) — Egyptian Academy of Scientific Research and Technology, Egypt.
- **Award of Scientific Publications: "The Most Referenced Researcher in Egypt"**, 2014 (for 2013) — Misr El-Kheir Foundation, Egypt.
- **Award of Scientific Publications: "One of the Best Papers Published in an International High-Impact Journal (Natural Sciences)"**, 2014 (for 2013) — Misr El-Kheir Foundation, Egypt (Paper No. 83).
- **Award for Excellence in Scientific Publishing**, 2012 — Projects Management Unit, Ministry of Higher Education, Egypt.
- **Award of Scientific Publications: "One of the Best Papers Published in an International High-Impact Journal (Natural Sciences)"**, 2010 — Misr El-Kheir Foundation, Egypt.
- **Egyptian Incentive (Encouragement) Award in Basic Sciences (Physics)**, 2005 — Egyptian Academy of Scientific Research and Technology, Egypt.

Distinguished Invitations

- **Participant**, Annual Meeting of the Alexander von Humboldt Foundation, Berlin, Germany, 19–21 June 2012.
- **Participant**, Annual Meeting of the Alexander von Humboldt Foundation, Berlin, Germany, 4–6 June 2007.
- **Participant**, 58th Lindau Nobel Laureate Meeting — Council for the Lindau Nobel Laureate Meetings, Lindau, Germany, 29 June–4 July 2008.
- **Visiting Professor**, 2011 — International Centre for Advanced Studies in Physical Sciences, Faculty of Physics and Astronomy, Ruhr-University Bochum, Germany.
- **Visiting Research Fellow**, 2010 — International Centre for Advanced Studies in Physical Sciences, Faculty of Physics and Astronomy, Ruhr-University Bochum, Germany.

Academic References

- **PD Dr. Horst Fichtner** Co-PI in Alexander von Humboldt Project; Research Collaborator. Institute for Theoretical Physics IV, Faculty of Physics and Astronomy, Ruhr University Bochum, D–44780 Bochum, Germany. Tel.: +49 234 32 23786 (office); Fax: +49 234 32 14177. hf@tp4.rub.de
- **Prof. Dr. Marian Lazar** Research Collaborator. Center for Plasma Astrophysics, KU Leuven, Celestijnenlaan 200B, B–3001 Leuven, Belgium; Institute for Theoretical Physics IV, Faculty of Physics and Astronomy, Ruhr University Bochum, D–44780 Bochum, Germany. mlazar@tp4.rub.de
- **Prof. Dr. Ioannis Kourakis** Research Collaborator. Department of Mathematics, College of Science and Engineering, Khalifa University of Science and Technology, P.O. Box 127788, Abu Dhabi, UAE. ioanniskourakissci@gmail.com

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