

Dr. Yehia EISSA

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Date of birth: 12 November 1984

Sex: Male

Nationality: Egyptian

Short Bio

I currently hold the position of Chargé de recherche within the framework of the SciDoSol Sponsorship Chair of the Centre Observation, Impacts, Energy (O.I.E.), Mines Paris – PSL, Pierre Laffitte campus in Sophia Antipolis. Within the International Energy Agency Photovoltaic Power Systems Programme (IEA PVPS), I am currently leading Subtask 3: Focus topics, under Task 16: Solar Resource for High Penetration and Large-Scale Applications.

My research focuses on improving the understanding of the downwelling surface solar resource through physical and empirical modelling, exploiting satellites images, atmospheric monitoring data and in situ measurements. My work contributes to advancing knowledge of the solar resource, supporting the shift toward renewable energy solutions. In addition to research and supervision activities, I am involved in teaching activities relating to fundamentals of solar radiation, measurement and modelling techniques, solar resource for concentrating collectors and solar cookers, and I have previous experience in teaching physics courses.

Education

Mines Paris – PSL, France

Oct. 2012 – June 2015

Ph.D. in Energy and Processes.

Thesis title: Modelling the beam and circumsolar radiation under cloud-free conditions in desert environment.

Masdar Institute, UAE

Sept. 2010 – May 2012

M.Sc. in Water and Environmental Engineering, CGPA: 3.875.

Thesis title: Developing and validating satellite-based models for solar irradiance retrieval over desert environments: UAE case study.

**The American University
in Cairo, Egypt**

Sept. 2006 – June 2008 (M.Sc.)

Sept. 2002 – June 2006 (B.Sc.)

M.Sc. in Physics, CGPA: 3.675.

Thesis title: Geotechnical investigation of the new site of the American University in Cairo.

B.Sc. in Physics, specialization in instrumentation.

Professional Experience

June 2024 – Present

Chargé de recherche, SciDoSol Sponsorship Chair, Centre Observation, Impacts, Energy (O.I.E.), Mines Paris – PSL, Sophia Antipolis.

Aug. 2020 – June 2024

Head of Department and Lecturer of Physics, the German International University in Egypt.

Apr. 2018 – Aug. 2020

Consultant, Research Intelligence, Elsevier.

Sept. 2010 – Apr. 2018

Research Center for Renewable Energy Mapping and Assessment, Masdar Institute, Khalifa University of Science and Technology, UAE: Postdoctoral Researcher (June 2015 – Apr. 2018), Research Engineer (June 2012 – June 2015), Research Assistant (Sept. 2010 – May 2012).

Sept. 2009 – Sept. 2010

Applied Science Researcher at GREEN Environment Consultants, Egypt.

Sept. 2008 – June 2009

Physics Laboratory Instructor at Qatar University, Qatar.

Jan. 2008 – Sept. 2008

Project Coordinator at Wadi Environmental Science Center NGO, Egypt.

Feb. 2007 – Jan. 2008

Physics Teaching Assistant at the American University in Cairo, Egypt.

Awards

Oct. 2013

Desert Energy Best Paper Award from the Desertec University Network and Dii. Awarded at the 4th Dii Desert Energy Conference, Rabat, Morocco, 30–31 Oct. 2013.

Dec. 2011

A travel grant from the American Geophysical Union (AGU) to attend the AGU Fall Meeting, 5–9 Dec. 2011, San Francisco, California, USA.

Sept. 2010 – June 2012

M.Sc. scholarship in Water and Environmental Engineering from Masdar Institute.

Feb. 2007 – Jan. 2008

Laboratory Instruction Graduate Fellowship from the American University in Cairo.

May 2006

Shell Personal Development Award from Shell.

Interests

- Solar resource modelling
 - Data analysis
 - Atmospheric composition
 - In-situ measurements
 - Teaching: solar radiation (fundamentals, measurement and modelling techniques, resources for concentrating collectors); solar cookers; physics for undergraduate students
 - Hands-on project with students
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Project Involvements

- SciDoSol, a sponsorship chair hosted by Centre O.I.E., Mines Paris – PSL (France), and funded by TotalEnergies, RTE, SOMFY, TSE and CalibSun. SciDoSol is dedicated to data science applied to Earth observation data and solar energy for the energy transition. Its three pillars are: scientific research, training and teaching activities, and transfer to industry. Time period of my involvement: 2024 – present.
 - Integration of the solar resource and weather data within a console at K.A.CARE (Saudi Arabia), and management of the Saudi Sustainable Energy Console Center. Project funded by K.A.CARE, and conducted in collaboration with Elia Grid International. Time period of my involvement: 2018.
 - Real-time detection of fog over the UAE using satellite imagery: Masdar Institute (UAE). Project funded by Etihad Airways. Time period of my involvement: 2016.
 - SUSIE (SURface Solar Irradiance in Egypt for energy production)/MISRA (MIsr Solar Radiation Atlas): a collaboration between the Egyptian Meteorological Authority (Egypt), Port Said University (Egypt), Cairo University (Egypt), Université de Paris Est Créteil (France), Masdar Institute (UAE), Mines Paris – PSL (France) and the German Weather Bureau. Project funded by a number of sources: STDF (Egypt), AIRD (France), French Ministry of Foreign Affairs and UAE Government. Time period of my involvement: 2014 – 2016.
 - Saudi Arabia solar atlas project: Masdar Institute (UAE). Project funded by K.A.CARE (Saudi Arabia). Time period of my involvement: 2013 – 2016.
 - PREDISOL (PREDIcting SOLar radiation): a collaboration between Mines Paris – PSL (France), Masdar Institute (UAE) and TotalEnergies (France). Project funded by TotalEnergies. Time period of my involvement: 2012 – 2015.
 - UAE solar atlas project: Masdar Institute (UAE). Project funded by the UAE Ministry of Foreign Affairs. Time period of my involvement: 2010 – 2012, regularly updated to date.
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Language Skills

- Arabic: native proficiency.
 - English: full professional proficiency.
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Author Profiles (as of 09/2026)

- [Google Scholar](#): *h*-index – 10; *i*10-index – 10.
 - [Scopus](#): ID – 55151384100; *h*-index – 9.
 - [Web of Science](#): ID – N-5582-2019; *h*-index – 9.
 - [HAL](#): Eissa-Yehia.
 - [ORCID](#): 0000-0003-3006-8359.
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List of Publications

Refereed journal articles

- Eissa, Y., Saint-Drenan, Y.-M., Schroedter-Homscheidt, M., Arola, A., Blanc, P., 2026. Impact of circumsolar irradiance and aerosol optical depth on CAMS surface solar irradiance estimates. *Renewable Energy* 276. 126447. doi: <https://doi.org/10.1016/j.renene.2026.126447>.
- Saint-Drenan, Y.-M., Wald, L., Voyant, C., Lefèvre, M., and Eissa, Y., 2026. MuscaDet – A multiscale and uncertainty-aware detector of cloud-free periods in time series of 1 min measurements of solar irradiance at ground level. *EGUsphere* [preprint]. doi: <https://doi.org/10.5194/egusphere-2026-3204>.
- Becquet, V., Saint-Drenan, Y.-M., Blanc, P., Eissa, Y., Verbois, H., 2026. Spatial context importance in deep learning for global horizontal irradiance estimation from satellite imagery. *Solar Energy* 317. 114844. doi: <https://doi.org/10.1016/j.solener.2026.114844>.
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- Chesnoiu, G., Gschwind, B., Saint-Drenan, Y.-M., Eissa, Y., Badosa, J., Blanc, P., 2026. SOLARSPECTRA, a new physical transposition model to estimate all-sky spectral tilted solar irradiance. *Solar Energy* 317, 114973. doi: <https://doi.org/10.1016/j.solener.2026.114973>.
- Magliaro, E., Voyant, C., Jheelan, Y., Michiorri, A., Julien, A., Eissa, Y., Bright, J., 2026. Energy-consistent multi-input multi-output multi-horizon extreme learning machines with embedded reconciliation for multi-source power forecasting. SSRN [preprint]. doi: <https://doi.org/10.2139/ssrn.6097181>.
- Bham, S., Chesnoiu, G., Gschwind, B., Eissa, Y., Blanc, P., 2026. McClear_Radiance physical model for estimating clear sky downwelling and upwelling solar irradiance on tilted surfaces. *Solar Energy* 304, 114187. doi: <https://doi.org/10.1016/j.solener.2025.114187>.
- Khaled, A., Boraïy, M., Eissa, Y., El-Metwally, M., Alfaro, S., 2025. Retrieval of long-term (1980-2024) time series of PM10 concentration by an empirical method: the Paris, Cairo, and New Delhi case studies. *Atmosphere* 16(11), 1272. doi: <https://doi.org/10.3390/atmos16111272>.
- Eissa, Y., Beegum, S. N., Gherboudj, I., Chaouch, N., Al Sudairi, J., Jones, R. K., Al Dobayan, N., Ghedira, H., 2018. Prediction of the day-ahead clear-sky downwelling surface solar irradiances using the REST2 model and WRF-CHIMERE simulations over the Arabian Peninsula. *Solar Energy* 162, 36–44. doi: <http://dx.doi.org/10.1016/j.solener.2018.01.003>.
- Eissa, Y., Blanc, P., Ghedira, H., Oumbe, A., Wald, L., 2018. A fast and simple model to estimate the contribution of the circumsolar irradiance to measured broadband beam irradiance under cloud-free conditions in desert environment. *Solar Energy* 163, 497–509. doi: <http://dx.doi.org/10.1016/j.solener.2018.02.015>.
- Boraïy, M., Korany, M., Aoun, Y., Alfaro, S., El-Metwally, M., Abdel Wahab, M., Blanc, P., Eissa, Y., Ghedira, H., Siour, G., Hungershoefer, K., Wald, L., 2017. Improving direct normal irradiance retrieval in cloud-free, but high aerosol load conditions by using aerosol optical depth. *Meteorologische Zeitschrift* 26, 475–483. doi: <http://dx.doi.org/10.1127/metz/2017/0844>.
- Korany, M., Boraïy, M., Eissa, Y., Aoun, Y., Abdel Wahab, M., Alfaro, S., Blanc, P., El-Metwally, M., Ghedira, H., Hungershoefer, K., Wald, L., 2016. A database of multi-year (2004–2010) quality-assured surface solar hourly irradiation measurements for the Egyptian territory. *Earth System Science Data* 8, 105–113. doi: <http://dx.doi.org/10.5194/essd-8-105-2016>.
- Eissa, Y., Blanc, P., Wald, L., Ghedira, H., 2015. Can AERONET data be used to accurately model the monochromatic beam and circumsolar irradiances under cloud-free conditions in desert environment? *Atmospheric Measurement Techniques* 8, 5099–5112. doi: <http://dx.doi.org/10.5194/amt-8-5099-2015>.
- Eissa, Y., Korany, M., Aoun, Y., Boraïy, M., Abdel Wahab, M., Alfaro, S., Blanc, P., El-Metwally, M., Ghedira, H., Hungershoefer, K., Wald, L., 2015. Validation of the surface downwelling solar irradiance estimates of the HelioClim-3 database in Egypt. *Remote Sensing* 7, 9269–9291. doi: <http://dx.doi.org/10.3390/rs70709269>.
- Eissa, Y., Munawwar, S., Oumbe, A., Blanc, P., Ghedira, H., Wald, L., Bru, H., Goffe, D., 2015. Validating surface downwelling solar irradiances estimated by the McClear model under cloud-free skies in the United Arab Emirates. *Solar Energy* 114, 17–31. doi: <http://dx.doi.org/10.1016/j.solener.2015.01.017>.
- Lazzarini, M., Marpu, P.R., Eissa, Y., Ghedira, H., 2014. Toward a near real-time product of air temperature maps from satellite data and in situ measurements in arid environments. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 7, 3093–3104. doi: <http://dx.doi.org/10.1109/JSTARS.2014.2320762>.
- Eissa, Y., Marpu, P.R., Gherboudj, I., Ghedira, H., Ouarda, T. B.M.J., Chiesa, M., 2013. Artificial neural network based model for retrieval of the direct normal, diffuse horizontal and global horizontal irradiances using SEVIRI images. *Solar Energy* 89, 1–16. doi: <http://dx.doi.org/10.1016/j.solener.2012.12.008>.
- Eissa, Y., Chiesa, M., Ghedira, H., 2012. Assessment and recalibration of the Heliosat-2 method in global horizontal irradiance modeling over the desert environment of the UAE. *Solar Energy* 86, 1816–1825. doi: <http://dx.doi.org/10.1016/j.solener.2012.03.005>.

Ph.D. thesis

- Eissa, Y., 2015. Modelling the beam and circumsolar radiation under cloud-free conditions in desert environment. Ph.D. thesis in Energy and Processes, Mines Paris – PSL. <https://pastel.archives-ouvertes.fr/tel-01168647/>.

Conference proceedings

- Chesnoiu, G., Bham, S., Gschwind, B., Saint-Drenan, Y.-M., Eissa, Y., Blanc, P., 2025. Preliminary evaluation of a new tool for modeling all-sky spectral solar radiation on tilted orientations for agrivoltaic applications. 2025 IEEE 53rd Photovoltaic Specialists Conference (PVSC), Montreal, QC, Canada, (pp. 0890-0892). doi: <https://doi.org/10.1109/PVSC59419.2025.11133421>.
- Eissa, Y., Blanc, P., Oumbe, A., Ghedira, H., Wald, L., 2014. Estimation of the circumsolar ratio in a turbid atmosphere. ISES Solar World Congress, 3–7 Nov. 2013, Cancun, Mexico. *Energy Procedia* 57, 1169–1178. doi: <http://dx.doi.org/10.1016/j.egypro.2014.10.104>.
- Eissa, Y., Gustafson, B., Ghedira, H., Bender, G., Ouarda, T. B.M.J., 2014. Intercomparison of solar maps derived from an ensemble-ANN model and a semi-empirical model for a desert environment. SolarPACES, 17–20 Sept. 2013, Las Vegas, Nevada, USA. *Energy Procedia* 49, 2313–2320. doi: <http://dx.doi.org/10.1016/j.egypro.2014.03.245>.
- Ghedira, H., Eissa, Y., 2014. Global tilt irradiation map of the United Arab Emirates. ISES Solar World Congress, 3–7 Nov. 2013, Cancun, Mexico. *Energy Procedia* 57, 1199–1205. doi: <http://dx.doi.org/10.1016/j.egypro.2014.10.107>.

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- Oumbe, A., Bru, H., Hassar, Z., Blanc, P., Wald, L., Eissa, Y., Marpu, P., Gherboudj, I., Ghedira, H., Goffe, D., 2013. On the improvement of MACC aerosol spatial resolution for irradiance estimation in the United Arab Emirates. ISES Solar World Congress, 3–7 Nov. 2013, Cancun, Mexico.
- Eissa, Y., Ghedira, H., Chiesa, M., Marpu, P.R., Ouarda, T. B.M.J., 2012. Recalibration of Heliosat-2 method for global horizontal irradiance estimation in dusty and humid environments. World Renewable Energy Forum, 13–17 May 2012. Denver, Colorado, USA.
- Eissa, Y., Ghedira, H., Ouarda, T. B.M.J., Chiesa, M., 2012. Dust detection over bright surfaces using high-resolution visible SEVIRI images. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 22–27 July 2012, Munich, Germany. doi: <http://dx.doi.org/10.1109/IGARSS.2012.6350619>.
- Eissa, Y., Marpu, P.R., Ghedira, H., Chiesa, M., 2012. SEVIRI-derived direct normal irradiance using Heliosat-2 global horizontal irradiance and a neural network ensemble: a comparison. EuroSun, 18–20 Sept. 2012, Croatia.
- Eissa, Y., Marpu, P.R., Ghedira, H., Ouarda, T. B.M.J., Chiesa, M., 2012. An artificial neural network based approach for estimating direct normal, diffuse horizontal and global horizontal irradiances using satellite images. World Renewable Energy Forum, 13–17 May 2012. Denver, Colorado, USA.
- Eissa, Y., Marpu, P.R., Ghedira, H., Ouarda, T. B.M.J., Chiesa, M., 2012. Analyzing temporal and spatial variations of direct normal, diffuse horizontal and global horizontal irradiances estimated from an artificial neural network based model. World Renewable Energy Forum, 13–17 May 2012. Denver, Colorado, USA.
- Eissa, Y., Marpu, P.R., Ghedira, H., Ouarda, T. B.M.J., Chiesa, M., 2012. Near-nowcasting tool for direct normal and global horizontal irradiance estimations using SEVIRI images. EuroSun, 18–20 Sept. 2012, Croatia.
- Munawwar, S., Eissa, Y., Ghedira, H., Chiesa, M., 2012. Challenges of satellite-based solar resource assessment in dusty environment: the UAE case study. SolarPACES, 11–14 Sept. 2012, Marrakech, Morocco.
- Abstracts and presentations**
- Aragon Cerecedes, M., Saint-Drenan, Y.-M., Eissa, Y., Blanc, P., Veerman, M., van Heerwaarden, C., Schmidt, T., 2026. Spatial solar irradiance emulation of Monte Carlo ray tracing with multi-view all-sky imagery. EGU General Assembly 2026, 3–8 May 2026, Vienna, Austria.
- Remund, J., Sengupta, M., Wilbert, S., Lorenz, E., Amaro e Silva, R., Eissa, Y., Jensen, A., 2026. IEA PVPS Task 16 – Phase IV. EU PVSEC 2026, 14–18 September 2026, Rotterdam, The Netherlands.
- Bauer, V., Eissa, Y., Saint-Drenan, Y.-M., Blanc, P., 2025. An affordable and open-source all-sky imager for measuring diffuse sky radiance. Young Scientist Symposium 2025, 18 Nov 2025, Klosterneuburg, Austria. doi: <https://doi.org/10.34726/11416>.
- Becquet, V., Blanc, P., Saint-Drenan, Y.-M., Eissa, Y., 2025. Deep learning and spatial context for global horizontal irradiance estimation: Addressing independent pixel approximation limitations with satellite imagery. EMS Annual Meeting 2025, 7–12 Sep 2025, Ljubljana, Slovenia. doi: <https://doi.org/10.5194/ems2025-294>.
- Eissa, Y., Beegum, S. N., Gherboudj, I., Chaouch, N., Al Sudairi, J., Jones, R. K., Al Dobayan, N., Ghedira, H. Prediction of the day-ahead clear-sky downwelling surface solar irradiances using the REST2 model and WRF-CHIMERE simulations over the Arabian Peninsula. ISES Solar World Congress, 29 Oct.–2 Nov. 2017, Abu Dhabi, UAE.
- Eissa, Y., Blanc, P., Wald, L., Ghedira, H., 2015. Preliminary results on modelling the monochromatic beam and circumsolar radiation under cloud-free conditions in desert environment. 3rd International Conference Energy & Meteorology (ICEM), 22–26 June 2015, Boulder, Colorado, USA.
- Eissa, Y., Korany, M., Aoun, Y., Boraïy, M., Abdel Wahab, M., Alfaro, S., Blanc, P., El-Metwally, M., Ghedira, H., Hungerschofer, K., Wald, L., 2015. Comparison between estimates of the surface downwelling solar irradiances under cloud-free skies extracted from the McClear and HelioClim-3 services over Egypt. 3rd International Conference Energy & Meteorology (ICEM), 22–26 June 2015, Boulder, Colorado, USA.
- Eissa, Y., Marpu, P.R., Ghedira, H., Chiesa, M., 2012. Temporal and spatial assessment of yearly solar maps derived from satellite images over the UAE and Qatar. AGU Fall Meeting, 3–7 Dec. 2012, San Francisco, California, USA.
- Ghedira, H., Eissa, Y., 2012. A comparison between Heliosat-2 and artificial neural network methods for global horizontal irradiance retrievals over desert environments. AGU Fall Meeting, 3–7 Dec. 2012, San Francisco, California, USA.
- Marpu, P.R., Eissa, Y., Al Meqbali, N., Ghedira, H., 2012. Dust indicator maps for improving solar radiation estimation from satellite data. AGU Fall Meeting, 3–7 Dec. 2012, San Francisco, California, USA.
- Eissa, Y., Ghedira, H., 2011. Seasonal and geographical variation of Linke turbidity factor and its effect on global horizontal irradiance estimation: UAE case study. AGU Fall Meeting, 5–9 Dec. 2011, San Francisco, California, USA.
- Ghedira, H., Eissa, Y., 2011. Novel technique to retrieve the direct normal irradiance from SEVIRI images over the UAE. AGU Fall Meeting, 5–9 Dec. 2011, San Francisco, California, USA.
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