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Research interests

Transparent electronics, Thin film transistors, Metal oxide semiconductors, Thin films, Microelectronics Nanotechnology, Biosensors

B.Sc. in Physics and Materials Engineering (1987, FCT/UNL); Equivalent academic master course - Semiconductor Materials (1991, FCT/UNL). Ph.D. in Materials Engineering: Microelectronics and Optoelectronics (1995, FCT/UNL). Aggregate in Microelectronics and Optoelectronics (2005). Associate Professor of FCT/UNL and Full Member of CENIMAT. Full Member of CENIMAT and Head of CENIMAT. Main scientific interests: Devices Based on Amorphous Semiconductors and Oxide Semiconductors. Optoelectronics, Microelectronics and Nanoelectronics. Transparent Flexible Electronics.

Short CV

Elvira Fortunato is full professor in Materials Science Department of Faculty of Science and Technology of New University of Lisbon, a Fellow of the Portuguese Engineering Academy since 2009 and decorated with the grade of Grand Officer of the Order of Prince Henry the Navigator by the President of the Republic in 2010, due to her scientific achievements worldwide. In 2015 she was appointed by the Portuguese President Chairman of the Organizing Committee of the Celebrations of the National Day of Portugal, Camões and the Portuguese Communities.

She was also a member of the Portuguese National Scientific and Technological Council between 2012-2015 and a member of the advisory board of DG CONNECT (2014-2015). Since November 2015 she became Deputy Adviser of the High Level Group of Scientific Advice Mechanism from DG Research & Innovation European Commission.

Currently she is the director of the Institute of Nanomaterials, Nanofabrication and Nanomodeling and of CENIMAT. She is member of the board of trustees of Luso-American Foundation (Portugal/USA, 2013-2020).

Fortunato pioneered European research on transparent electronics, namely thin-film transistors based on oxide semiconductors, demonstrating that oxide materials can be used as true semiconductors. In 2008, she earned in the 1st ERC edition an AdG for the project "Invisible", considered a success story. In the same year she demonstrated with her colleagues the possibility to make the first paper transistor, starting a new field in the area of paper electronics.

Fortunato published over 500 papers and during the last 10 years got more than 16 International prizes and distinctions for her work (e.g. IDTechEx USA 2009 (paper transistor); European Woman Innovation prize, Finland 2011).

Research outputs

- Ta₂O₅/SiO₂ Multicomponent Dielectrics for Amorphous Oxide TFTs**
Martins, J., Kiazadeh, A., Pinto, J. V., Rovisco, A., Gonçalves, T., Deuermeier, J., Alves, E., Martins, R., Fortunato, E. & Barquinha, P., 29 Dec 2020, In : Electronic Materials. 2, 1, p. 1-16
- Design of wave-optical structured substrates for ultra-thin perovskite solar cells**
Haque, S., Alexandre, M., Mendes, M. J., Águas, H., Fortunato, E. & Martins, R., Sep 2020, In : Applied Materials Today. 20, 100720.
- Cellulose-Based Solid Electrolyte Membranes Through Microwave Assisted Regeneration and Application in Electrochromic Displays**
Duarte, P., Pereira, S., Cunha, I., Pimentel, A., Dionísio, M., Fortunato, E., Martins, R. & Pereira, L., 14 Aug 2020, In : Frontiers in Materials. 7, 269.
- Application of ultrasonic sprayed zirconium oxide dielectric in zinc tin oxide-based thin film transistor**
Oluwabi, A. T., Katerski, A., Carlos, E., Branquinho, R., Mere, A., Krunks, M., Fortunato, E., Pereira, L. & Oja Acik, I., 21 Mar 2020, In : Journal of Materials Chemistry C. 8, 11, p. 3730-3739
- Ionically Modified Cellulose Nanocrystal Self-Assembled Films with a Mesoporous Twisted Superstructure: Polarizability and Application in Ion-Gated Transistors**
Grey, P., Fernandes, S. N., Gaspar, D., Deuermeier, J., Martins, R., Fortunato, E., Godinho, M. H. & Pereira, L., 25 Feb 2020, In : ACS Applied Electronic Materials. 2, 2, p. 426-436

6. **2D Resistive Switching Based on Amorphous Zinc-Tin Oxide Schottky Diodes**
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7. **Photonic-structured TCO front contacts yielding optical and electrically enhanced thin-film solar cells**
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8. **Control of eu oxidation state in Y_2O_3 -xSx:Eu thin-film phosphors prepared by atomic layer deposition: A structural and photoluminescence study**
Rosa, J., Deuermeier, J., Soininen, P. J., Bosund, M., Zhu, Z., Fortunato, E., Martins, R., Sugiyama, M. & Merdes, S., 1 Jan 2020, In : Materials. 13, 1, 93.
9. **Touch-Interactive Flexible Sustainable Energy Harvester and Self-Powered Smart Card**
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10. **Paper-Based SERS Platform for One-Step Screening of Tetracycline in Milk**
Marques, A., Veigas, B., Araújo, A., Pagará, B., Baptista, P. V., Águas, H., Martins, R. & Fortunato, E., 1 Dec 2019, In : Scientific Reports. 9, 1, 17922.
11. **Prediction of sunlight-driven CO_2 conversion: Producing methane from photovoltaics, and full system design for single-house application**
Vieira, F., Sarmiento, B., Reis-Machado, A. S., Facão, J., Carvalho, M. J., Mendes, M. J., Fortunato, E. & Martins, R., 1 Dec 2019, In : Materials Today Energy. 14, 100333.
12. **Design and simple assembly of gold nanostar bioconjugates for surface-enhanced raman spectroscopy immunoassays**
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13. **Hybrid (Ag)ZnO/Cs/PMMA nanocomposite thin films**
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16. **Sustainable fully printed UV sensors on cork using zinc oxide/ethylcellulose inks**
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17. **Tailoring IGZO composition for enhanced fully solution-based thin film transistors**
Moreira, M., Carlos, E., Dias, C., Deuermeier, J., Pereira, M., Barquinha, P., Branquinho, R., Martins, R. & Fortunato, E., 1 Sep 2019, In : Nanomaterials. 9, 9, 1273.
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20. **Growth mechanism of seed-layer free $ZnSnO_3$ nanowires: effect of physical parameters**
Rovisco, A., Branquinho, R., Martins, J., Fortunato, E., Martins, R. & Barquinha, P., 1 Jul 2019, In : Nanomaterials. 9, 7, 1002.
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24. **Human-motion interactive energy harvester based on polyaniline functionalized textile fibers following metal/polymer mechano-responsive charge transfer mechanism**
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25. **Field-Effect Transistors on Photonic Cellulose Nanocrystal Solid Electrolyte for Circular Polarized Light Sensing**
Grey, P., Fernandes, S. N., Gaspar, D., Fortunato, E., Martins, R., Godinho, M. H. & Pereira, L., 23 May 2019, In : Advanced Functional Materials. 29, 21(SI), 1805279.
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Nunes, S. C., Saraiva, S. M., Pereira, R. F. P., Pereira, S., Silva, M. M., Carlos, L. D., Fortunato, E., Ferreira, R. A. S., Rego, R. & Bermudez, V. D. Z., 25 Mar 2019, In : ACS Applied Energy Materials. 2, 3, p. 1951-1960 10 p.
29. **Ultrafast Low-Temperature Crystallization of Solar Cell Graded Formamidinium-Cesium Mixed-Cation Lead Mixed-Halide Perovskites Using a Reproducible Microwave-Based Process**
Brites, M. J., Barreiros, M. A., Corregidor, V., Alves, L. C., Pinto, J. V., Mendes, M. J., Fortunato, E., Martins, R. & Mascarenhas, J., 25 Mar 2019, In : ACS Applied Energy Materials. 2, 3, p. 1844-1853 10 p.
30. **Three-Mode Modulation Electrochromic Device with High Energy Efficiency for Windows of Buildings Located in Continental Climatic Regions**
Cardoso, M. A., Pereira, R. F. P., Pereira, S., Gonçalves, H., Silva, M. M., Carlos, L. D., Nunes, S. C., Fortunato, E., Ferreira, R. A. S., Rego, R. & Bermudez, V. D. Z., 3 Mar 2019, In : ADVANCED SUSTAINABLE SYSTEMS. 3, 3, 1800115.
31. **Role of structure and composition on the performances of P-type tin oxide thin-film transistors processed at low-temperatures**
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32. **Sol-gel processed p-type CuAlO₂ semiconductor thin films and the integration in transistors**
Wang, C., Zhu, H., Meng, Y., Nie, S., Zhao, Y., Shin, B., Fortunato, E., Martins, R., Shan, F. & Liu, G., 1 Mar 2019, In : Ieee Transactions On Electron Devices. 66, 3, p. 1458-1463 6 p., 8630855.
33. **E-Skin Bimodal Sensors for Robotics and Prosthesis Using PDMS Molds Engraved by Laser**
Dos Santos, A., Pinela, N., Alves, P., Santos, R., Farinha, R., Fortunato, E., Martins, R., Águas, H. & Igreja, R., 21 Feb 2019, In : Sensors (Basel, Switzerland). 19, 4, p. 1-15 899.
34. **Multi-Level Cell Properties of a Bilayer Cu₂O/Al₂O₃ Resistive Switching Device**
Deuermeier, J., Kiazadeh, A., Klein, A., Martins, R. & Fortunato, E., 19 Feb 2019, In : Nanomaterials. 9, 2, 289.
35. **Tailoring Upconversion and Morphology of Yb/Eu Doped Y₂O₃ Nanostructures by Acid Composition Mediation**
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36. **Demonstration of the adhesive properties of the medium-chain-length polyhydroxyalkanoate produced by Pseudomonas chlororaphis subsp. aurantiaca from glycerol**
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Carvalho, J. T., Dubceac, V., Grey, P., Cunha, I., Fortunato, E., Martins, R., Clausner, A., Zschech, E. & Pereira, L., 1 Feb 2019, In : Nanomaterials. 9, 2, 169.
38. **Molecularly-imprinted chloramphenicol sensor with laser-induced graphene electrodes**
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39. **Label-Free Nanosensing Platform for Breast Cancer Exosome Profiling**
Ferreira, N., Marques, A., Águas, H., Bandarenka, H., Martins, R., Bodo, C., Costa-Silva, B. & Fortunato, E., 1 Jan 2019, In : ACS Sensors.

40. **Oxide TFT Rectifiers on Flexible Substrates Operating at NFC Frequency Range**
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41. **Biofilm development and computational screening for new putative inhibitors of a homolog of the regulatory protein BrpA in *Streptococcus dysgalactiae* subsp. *dysgalactiae***
Alves-Barroco, C., Roma-Rodrigues, C., Balasubramanian, N., Guimarães, M. A., Ferreira-Carvalho, B. T., Muthukumar, J., Nunes, D., Fortunato, E., Martins, R., Santos-Silva, T., Figueiredo, A. M. S., Fernandes, A. R. & Santos-Sanches, I., 2019, In : International Journal Of Medical Microbiology. 309, 3-4
42. **Paper-based nanoplatfoms for multifunctional applications**
Matias, M. L., Nunes, D., Pimentel, A., Ferreira, S. H., Borda D'Agua, R., Duarte, M. P., Fortunato, E. & Martins, R., 2019, In : Journal of Nanomaterials. 2019, 6501923.
43. **Laser-Induced Graphene Strain Sensors Produced by Ultraviolet Irradiation of Polyimide**
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44. **Laser-induced electrodes towards low-cost flexible UV ZnO sensors**
Samouco, A., Marques, A. C., Pimentel, A., Martins, R. & Fortunato, E., 1 Dec 2018, In : Flexible and Printed Electronics. 3, 4, 044002.
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Fernandes, M., Freitas, V., Pereira, S., Leones, R., Silva, M. M., Carlos, L. D., Fortunato, E., Ferreira, R. A. S., Rego, R. & de Zea Bermudez, V., 1 Dec 2018, In : Energies. 11, 12, 3513.
46. **Multifunctional microfluidic chip for optical nanoprobe based RNA detection - Application to Chronic Myeloid Leukemia**
Alves, P. U., Vinhas, R., Fernandes, A. R., Birol, S. Z., Trabzon, L., Bernacka-Wojcik, I., Igreja, R., Lopes, P., Baptista, P. V., Águas, H., Fortunato, E. & Martins, R., 1 Dec 2018, In : Scientific Reports. 8, 1, 381.
47. **Planar Dual-Gate Paper/Oxide Field Effect Transistors as Universal Logic Gates**
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52. **Enhanced UV Flexible Photodetectors and Photocatalysts Based on TiO₂ Nanoplatfoms**
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53. **Wax-printed paper-based device for direct electrochemical detection of 3-nitrotyrosine**
Martins, G. V., Marques, A. C., Fortunato, E. & Sales, M. G. F., 10 Sep 2018, In : Electrochimica Acta. 284, p. 60-68 9 p.
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55. **Papertronics: Multigate paper transistor for multifunction applications**
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56. **Piezoresistive E-Skin Sensors Produced with Laser Engraved Molds**
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58. **Seed-Layer Free Zinc Tin Oxide Tailored Nanostructures for Nanoelectronic Applications: Effect of Chemical Parameters**
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Coutinho, I. C. R. F. & Fortunato, E., 28 Feb 2018, In : JOURNAL OF PHARMACY AND PHARMACOLOGY. 6, p. 175-187
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