Rodrigo Ferrão de Paiva Martins
Full Professor, Researcher
DCM - Departamento de Ciência dos Materiais
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Qualifications

Energy conversion and Semiconductors, Doctorate, “a-Si:H solar cells processing and characterization”, Universidade NOVA de Lisboa
Award Date: 4 May 1982

Semiconductor Materials, Master, “Photoconductivity in P Doped and Undoped Amorphous Germanium.”, University of Dundee
Award Date: 3 May 1977

Electronics Engineering, Telecommunications and applied Electronics, Bachelor
Award Date: 6 May 1975

Employment

Full Professor
DCM - Departamento de Ciência dos Materiais
Universidade NOVA de Lisboa
Portugal
11 Aug 1973 → present

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11 Aug 1973 → present

Researcher
UNINOVA-Instituto de Desenvolvimento de Novas Tecnologias
Universidade NOVA de Lisboa
11 Aug 1973 → present

President
IUMRS - International Union of Materials Research Society
Singapore
1 Jan 2021 → 1 Jan 2023

President
EurASc - European Academy of Sciences
Belgium
1 Jan 2018 → 1 Jan 2022

Founder and 1st Director, CENIMAT
1 Jan 1991 → 1 Jan 1995

Founder and Director, CEMOP
1 Jan 1989 → present

Research interests

Main scientific interests in the area of Optoelectronic Materials and Process Microelectronics; Amorphous semiconductor technology and its applications; Nanotechnologies and Nanomaterials.

Research output

1. **Electrospun Highly Aligned IGZO Nanofiber Arrays with Low-Thermal-Budget for Challenging Transistor and Integrated Electronics**
   He, B., He, G., Zhu, L., Cui, J., Fortunato, E. & Martins, R., 5 Feb 2024, In: Advanced Functional Materials. 34, 6, 12 p., 2310264.
2. **MXene-Enhanced Nanoscale Photoconduction in Perovskite Solar Cells Revealed by Conductive Atomic Force Microscopy**
   Panigrahi, S., Jana, S., Calmeiro, T., Fortunato, E., Mendes, M. J. & Martins, R., 10 Jan 2024, In: ACS Applied Materials and Interfaces. 16, 1, p. 1930-1940 11 p.
3. **Perspective: Zinc-Tin Oxide Based Memristors for Sustainable and Flexible In-Memory Computing Edge Devices**
   Silva, C., Deuermeier, J., Zhang, W., Carlos, E., Barquinha, P., Martins, R. & Kiazadeh, A., Nov 2023, In: Advanced Electronic Materials. 9, 11, 16 p., 2300286.
4. **Thermal-Carrier-Escape Mitigation in a Quantum-Dot-In-Perovskite Intermediate Band Solar Cell via Bandgap Engineering**
   Menda, U. D., Ribeiro, G., Deuermeier, J., López, E., Nunes, D., Jana, S., Artacho, I., Martins, R., Mora-Seró, I., Mendes, M. J. & Ramiro, I., 18 Oct 2023, In: ACS Photonics. 10, 10, p. 3647-3655 9 p.
5. **Energy-band engineering by 2D MXene doping for high-performance homojunction transistors and logic circuits**
   Wang, L., He, G., Wang, W., Xu, X., Jiang, S., Fortunato, E. & Martins, R., 1 Oct 2023, In: Journal of Materials Science and Technology. 159, p. 41-51 11 p.
6. **Sub-Bandgap Sensitization of Perovskite Semiconductors via Colloidal Quantum Dots Incorporation**
   Ribeiro, G., Ferreira, G., Menda, U. D., Alexandre, M., Brites, M. J., Barreiros, M. A., Jana, S., Águas, H., Martins, R., Fernandes, P. A., Salomé, P. & Mendes, M. J., 29 Aug 2023, In: Nanomaterials. 13, 17, 14 p., 2447.
7. **A simple polystyrene microfluidic device for sensitive and accurate SERS-based detection of infection by malaria parasites**
   Oliveira, M. J., Caetano, S., Dalot, A., Sabino, F., Calmeiro, T. R., Fortunato, E., Martins, R., Pereira, E., Prudêncio, M., Byrne, H. J., Franco, R. & Águas, H., 21 Aug 2023, In: Analyst. 148, 17, p. 4053-4063 11 p.
8. **Optically-Boosted Planar IBC Solar Cells with Electrically-Harmless Photonic Nanocoatings**
   Santos, I. M., Alexandre, M., Mihailetchi, V. D., Silva, J. A., Mateus, T., Mouquinho, A., Boane, J., Vicente, A. T., Nunes, D., Menda, U. D., Águas, H., Fortunato, E., Martins, R. & Mendes, M. J., 7 Aug 2023, In: Advanced Optical Materials. 11, 15, 11 p., 2300276.
9. **Open-source tool for real-time and automated analysis of droplet-based microfluidic**
   Neto, J. P., Mota, A., Lopes, G., Coelho, B. J., Frazão, J., Moura, A. T., Oliveira, B., Sieira, B., Fernandes, J., Fortunato, E., Martins, R., Igreja, R., Baptista, P. V. & Águas, H., 14 Jun 2023, (E-pub ahead of print) In: Lab On A Chip. 23, 14, p. 3238-3244 7 p.
10. **Recent progress in optoelectronic memristors for neuromorphic and in-memory computation**
    Pereira, M. E., Martins, R., Fortunato, E., Barquinha, P. & Kiazadeh, A., 1 Jun 2023, In: Neuromorphic Computing and Engineering. 3, 2, 33 p., 022002.
11. **Screen-printed, flexible, and eco-friendly thermoelectric touch sensors based on ethyl cellulose and graphite flakes inks**
    Figueira, J., Bonito, R. M., Carvalho, J. T., Vieira, E. M. F., Gaspar, C., Loureiro, J., Correia, J. H., Fortunato, E., Martins, R. & Pereira, L., 1 Jun 2023, In: Flexible and Printed Electronics. 8, 2, 13 p., 025001.
12. **Influence of CO_2 laser beam modelling on electronic and electrochemical properties of paper-based laser-induced graphene for disposable pH electrochemical sensors**
    Pinheiro, T., Rosa, A., Ornelas, C., Coelho, J., Fortunato, E., Marques, A. C. & Martins, R., Jun 2023, In: Carbon Trends. 11, 11 p., 100271.
13. **Studies on photocatalytic degradation of Rhodamine B using the valentinite Sb_2O_3**
    Abdellatif, M., Louafi, Y., Nunes, D., Freire, T., Fortunato, E., Martins, R., Kabouche, S. & Trari, M., Jun 2023, In: Reaction Kinetics, Mechanisms And Catalysis. 136, 3, p. 1643-1655 13 p.
14. **Hybrid Digital-Droplet Microfluidic Chip for Applications in Droplet Digital Nucleic Acid Amplification: Design, Fabrication and Characterization**
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15. **Parylene C as a Multipurpose Material for Electronics and Microfluidics**
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16. **Electrospinning-Driven Binary Oxide Nanofiber Networks with Tunable Amorphous Microstructure for Booming Transistors and Circuits Operation**
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18. **Microwave Synthesis of Visible-Light-Activated g-C_3N_4/TiO_2 Photocatalysts**
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21. **Parylene-Sealed Perovskite Nanocrystals Down-Shifting Layer for Luminescent Spectral Matching in Thin Film Photovoltaics**
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22. **Polyaniline and its composites engineering: A class of multifunctional smart energy materials**
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27. **Sustainable carbon sources for green laser-induced graphene: A perspective on fundamental principles, applications, and challenges**
Claro, P. I. C., Pinheiro, T., Silvestre, S. L., Marques, A. C., Coelho, J., Marconcini, J. M., Fortunato, E., Luiz, L. H. & Martins, R., Dec 2022, In: Applied Physics Reviews. 9, 4, 28 p., 041305.

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Pereira, M. E., Deuermeier, J., Figueiredo, C., Santos, Â., Carvalho, G., Tavares, V. G., Martins, R., Fortunato, E., Barquinha, P. & Kiazadeh, A., Nov 2022, In: Advanced Electronic Materials. 8, 11, 11 p., 2200642.

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33. **Copper-Arsenic-Sulfide Thin-Films from Local Raw Materials Deposited via RF Co-Sputtering for Photovoltaics**
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35. **A Comparison between Solution-Based Synthesis Methods of ZrO_2 Nanomaterials for Energy Storage Applications**
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36. **Foldable and Recyclable Iontronic Cellulose Nanopaper for Low-Power Paper Electronics**
Cunha, I., Ferreira, S. H., Martins, J., Fortunato, E., Gaspar, D., Martins, R. & Pereira, L., Sept 2022, In: ADVANCED SUSTAINABLE SYSTEMS. 6, 9, 15 p., 2200177.

37. **Floating TiO_2-Cork Nano-Photocatalysts for Water Purification Using Sunlight**
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38. **Photonic-Structured Perovskite Solar Cells: Detailed Optoelectronic Analysis**
Haque, S., Alexandre, M., Baretzky, C., Rossi, D., De Rossi, F., Vicente, A. T., Brunetti, F., Águas, H., Ferreira, R. A. S., Fortunato, E., Auf Der Maur, M., Wurfel, U., Martins, R. & Mendes, M. J., Jul 2022, In: ACS Photonics. 9, 7, p. 2408-2421 14 p.

39. **Solution Combustion Synthesis of Hafnium-Doped Indium Oxide Thin Films for Transparent Conductors**
Firmino, R., Carlos, E., Pinto, J. V., Deuermeier, J., Martins, R., Fortunato, E., Barquinha, P. & Branquinho, R., 23 Jun 2022, In: Nanomaterials. 12, 13, 14 p., 2167.

40. **Microwave-Assisted Synthesis of Zn2SnO4 Nanostructures for Photodegradation of Rhodamine B under UV and Sunlight**
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41. **Smart IoT enabled interactive self-powered security tag designed with functionalized paper**
Ferreira, G., Opinião, A., Das, S., Goswami, S., Pereira, L., Nandy, S., Martins, R. & Fortunato, E., May 2022, In: Nano Energy. 95, 107021.

42. **Tailoring the Interface in High Performance Planar Perovskite Solar Cell by ZnOS Thin Film**
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47. **Printed zinc tin oxide diodes: From combustion synthesis to large-scale manufacturing**
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50. **Molybdenum disulfide/polyaniline interlayer for lithium polysulphide trapping in lithium-sulphur batteries**
Versaci, D., Canale, I., Goswami, S., Amici, J., Francia, C., Fortunato, E., Martins, R., Pereira, L. & Bodoardo, S., 15 Feb 2022, In: Journal Of Power Sources. 521, p. 1-11 11 p., 230945.

51. **Emergent solution based IGZO memristor towards neuromorphic applications**
Martins, R. A., Carlos, E., Deuermeier, J., Pereira, M. E., Martins, R., Fortunato, E. & Kiazadeh, A., 14 Feb 2022, In: Journal of Materials Chemistry C. 10, 6, p. 1991-1998 8 p.

52. **Green economy and waste management: An inevitable plan for materials science**
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53. **Tailoring the synaptic properties of a-IGZO memristors for artificial deep neural networks**
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Freire, T., Fragoso, A. R., Matias, M., Pinto, J. V., Marques, A. C., Pimentel, A., Barquinha, P., Huertas, R., Fortunato, E., Martins, R. & Nunes, D., 1 Dec 2021, In: Nano Express. 2, 4, 040002.

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Figueira, J., Loureiro, J., Vieira, E., Fortunato, E., Martins, R. & Pereira, L., Dec 2021, In: Flexible and Printed Electronics. 6, 4, 045018.

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Alexandre, M., Águas, H., Fortunato, E., Martins, R. & Mendes, M. J., Dec 2021, In: Light: Science & Applications. 10, 1, 231.

59. **Materials as activator of future global science and technology challenges**
Martins, R., Dec 2021, In: Progress in Natural Science: Materials International. 31, 6, p. 785-791 7 p.

60. **Porous PDMS conformable coating for high power output carbon fibers/ZnO nanorod-based triboelectric energy harvesters**
Barras, R., dos Santos, A., Calmeiro, T. R., Fortunato, E., Martins, R., Águas, H., Barquinha, P., Igreja, R. & Pereira, L., Dec 2021, In: Nano Energy. 90, Part B, 106582.

61. **Laser-Induced Graphene on Paper toward Efficient Fabrication of Flexible, Planar Electrodes for Electrochemical Sensing**
Pinheiro, T., Silvestre, S., Coelho, J., Marques, A. C., Martins, R., Sales, M. G. F. & Fortunato, E., 23 Nov 2021, In: Advanced Materials Interfaces. 8, 22, 2101502.

62. **E-Skin Piezoresistive Pressure Sensor Combining Laser Engraving and Shrinking Polymeric Films for Health Monitoring Applications**
dos Santos, A., Fortunato, E., Martins, R., Águas, H. & Igreja, R., 9 Nov 2021, In: Advanced Materials Interfaces. 8, 21, 2100877.

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Freire, T., Fragoso, A. R. P., Matias, M., Pinto, J. V., Marques, A. C., Pimentel, A. C. M. B. G., Barquinha, P. M. C., Huertas, R. M., Fortunato, E., Martins, R. & Nunes, D., 22 Oct 2021, In: Nano Express. 2, 4

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Boane, J. L. N., Centeno, P., Mouquinho, A., Alexandre, M., Calmeiro, T., Fortunato, E., Martins, R., Mendes, M. J. & Águas, H., 11 Oct 2021, In: Micro. 1, 2, p. 215-227

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Menda, U. D., Ribeiro, G., Nunes, D., Calmeiro, T., Águas, H., Fortunato, E., Martins, R. & Mendes, M. J., 7 Oct 2021, In: Materials Advances. 2, 19, p. 6344-6355 12 p.

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69. **New challenges of printed high-κ oxide dielectrics**
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