

# Pedro Pires Ferreira

Lorena School of Engineering - University of São Paulo

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<https://computeel.org/>

## Education

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### PhD in Materials Science and Engineering

Materials Engineering Department - Lorena School of Engineering - University of Sao Paulo (EEL/USP)

September 2020 – Present

Lorena, Brazil

<http://www.demar.eel.usp.br/en/>

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### Master in Materials Science and Engineering

Materials Engineering Department - Lorena School of Engineering - University of Sao Paulo (EEL/USP)

August 2018 – September 2020

Lorena, Brazil

<http://www.demar.eel.usp.br/en/>

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### Bachelor in Engineering Physics

University of Sao Paulo

February 2014 – June 2018

Lorena, Brazil

<https://site.eel.usp.br/en/>

## Publications

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### 9. Possible multiband superconductivity in the quaternary carbide $YRe_2SiC$

Accepted in *Superconductor Science and Technology*

April 2021

L. R. de Faria, [P. P. Ferreira](#), L. E. Correa, L. T. F. Eleno, M. S. Torikachvili, A. J. S. Machado

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### 8. Thermodynamic modelling of the Al-Nb-V system

Submitted to *Calphad*

March 2021

J. C. P. Santos, A. A. A. P. Silva, [P. P. Ferreira](#), T. T. Dorini, D. F. Barros, D. A. Abreu, L. T. F. Eleno, C. A. Nunes, G. C. Coelho

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### 7. Multiband superconductivity and charge density waves in the topological semimetal Ni-doped $ZrTe_2$

Submitted to *Physical Review Materials*

February 2021

<https://arxiv.org/abs/2102.04812>

L. E. Correa, [P. P. Ferreira](#), L. R. de Faria, T. T. Dorini, Z. Fisk, M. S. Torikachvili, L. T. F. Eleno, A. J. S. Machado

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### 6. Strain engineering the topological type-II Dirac semimetal $NiTe_2$

*Physical Review B*

March 2021

<https://doi.org/10.1103/PhysRevB.103.125134>

<https://arxiv.org/abs/2006.14071>

[P. P. Ferreira](#), A. L. R. Manesco, T. T. Dorini, L. E. Correa, G. Weber, A. J. S. Machado, L. T. F. Eleno

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### 5. T<sub>2</sub> phase site occupancies in the Cr-Si-B system: a combined synchrotron-XRD/first-principles study

*Scripta Materialia*

March 2021

<https://doi.org/10.1016/j.scriptamat.2021.113854>

<https://arxiv.org/abs/2005.06900>

T. T. Dorini, B. X. de Freitas, [P. P. Ferreira](#), N. Chaia, P. A. Suzuki, J. M. Joubert, C. A. Nunes, G. C. Coelho, L. T. F. Eleno

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#### 4. Two-band superconductivity with unconventional pairing symmetry in $\text{HfV}_2\text{Ga}_4$

Physical Review Research

📅 April 2020

<https://doi.org/10.1103/PhysRevResearch.2.022001>

<https://arxiv.org/abs/1909.10712>

A. Bhattacharyya, [P. P. Ferreira](#), F. B. Santos, D. T. Adroja, J. S. Lord, L. E. Correa, A. J. S. Machado, A. L. R. Manesco, L. T. F. Eleno

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#### 3. Elastic anisotropy and thermal properties of extended linear chain compounds $\text{MV}_2\text{Ga}_4$ (M= Sc, Zr, Hf) from ab-initio calculations

Materialia

📅 December 2018

<https://doi.org/10.1016/j.mtla.2018.11.008>

<https://arxiv.org/abs/1811.07814>

[P. P. Ferreira](#), T. T. Dorini, F. B. Santos, A. J. S. Machado, L. T. F. Eleno

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#### 2. Insights into the unconventional superconductivity in $\text{HfV}_2\text{Ga}_4$ and $\text{ScV}_2\text{Ga}_4$ from first-principles electronic-structure calculations

Physical Review B

📅 July 2018

<https://doi.org/10.1103/PhysRevB.98.045126>

<https://arxiv.org/abs/1805.08285>

[P. P. Ferreira](#), F. B. Santos, A. J. S. Machado, H. M. Petrilli, L. T. F. Eleno

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#### 1. Basic concepts on the physics of the magnetic flux tubes formation near the Earth

Revista Brasileira de Ensino de Física

📅 January 2017

<https://doi.org/10.1590/1806-9126-rbef-2016-0190>

[P. P. Ferreira](#), M. V. D. Silveira, F. R. Cardoso, D. Koga, V. M. C. S. Souza, L. E. A. Vieira, G. F. Pérez, B. M. Cuadros-Melgar, W. D. Gonzalez, E. F. Santos

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## Prizes

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### Quantum Design International Prize

📅 March 2019

📍 Quantum Design

- In recognition of obtaining the degree of Engineering Physics with the highest distinction

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### Best undergraduate student of Engineering Physics

📅 June 2018

📍 University of São Paulo

- Best undergraduate student of Engineering Physics at the University of São Paulo

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### Best undergraduate work at SICINPE

📅 September 2016

📍 National Space Research Agency

- Honorable mention of best work on SICINPE of National Space Research Agency

# Fellowships

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## São Paulo Research Foundation

📅 October 2020 – Present

📍 University of São Paulo

🔗 <https://bv.fapesp.br/en/bolsas/193915/ab-initio-study-of-superconducting-and-topological-systems/>

- **PhD project:** Ab initio study of superconducting and topological systems
- **Supervisor:** Prof. Luiz Tadeu Fernandes Eleno
- **Grant number:** 2020/08258-0

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## São Paulo Research Foundation

📅 August 2018 – September 2020

📍 University of São Paulo

🔗 <https://bv.fapesp.br/en/bolsas/180283/ab-initio-investigation-of-electronic-and-phononic-properties-of-superconducting-TMDs/>

- **Master project:** Ab initio investigation of electronic and phononic properties of superconducting TMDs
- **Supervisor:** Prof. Luiz Tadeu Fernandes Eleno
- **Grant number:** 2018/10835-6

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## São Paulo Research Foundation

📅 August 2017 – June 2020

📍 University of São Paulo

🔗 <https://bv.fapesp.br/en/bolsas/172585/ab-initio-electronic-structure-and-elastic-properties-of-the-compound-scV2Ga4/>

- **Undergraduate project:** Ab initio calculation of the electronic structure and elastic properties of ScV<sub>2</sub>Ga<sub>4</sub> compound
- **Supervisor:** Prof. Luiz Tadeu Fernandes Eleno
- **Grant number:** 2017/11023-2