# Jonathan DA SILVA

## Curriculum Vitae

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in jonathan-da-silva

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| Birth | December 23, 1987 - Perpignan, France. |
| Nationality | French. |
| Marital status | Single. |

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## Skills

### IT & Programming

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| Operating systems | GNU/Linux, Mac OS X, Microsoft Windows | General tools | LaTeX, vi/vim, Microsoft Office, MobaXterm, Mathematica |
| **Back-end : Java** (environments, tools, frameworks) | IntelliJ, Java 8 and 11, JUnit, Mockito, Cucumber, Maven, Spring (Boot, WebFlux, Data JPA), Vert.x, REST, Swagger, SonarLint, Reactor/RxJava | **Front-end : Vue.js** (environment, tools, framework) | Visual Studio Code, Vue.js 2, Jest, Vue Test Utils, HTML5/CSS3, JavaScript, TypeScript, Angular 9 |
| **VCS : Git** | IntelliJ and Visual Studio Code Git integration, GitLab, Git Bash, Bitbucket | **Database, deployment** | jOOQ, MySQL, MariaDB, MongoDB, PostgreSQL, Liquibase, Ansible, Docker |
| Other programming langage | C, Fortran, Python, C++, Script Shell (Bash, bsh), FLTK | | |
| Specialized softwares | Systema, LanHEP, CalcHEP, micrOMEGAs, NMSSMTools, HiggsBounds/HiggsSignals, Rivet, Herwig, Pythia, Lilith, SModelS, MadAnalysis 5, MadGraph5_aMC@NLO | | |

### Languages

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| French | mother tongue | Portuguese | bilingual |
| English | fluent | Spanish | intermediate |

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## Professional Experience

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| 03/2021 - Present | **Full stack developer**, *i-Run*, Toulouse, France. |

Maintenance and evolution of the i-Run applications.
- Back-end : Java 8 and 11 - Spring WebFlux - JUnit 4 and 5 - hexagonal architecture
- Front-end : Vue.js 2 - Jest
- Database : jOOQ - MySQL - MariaDB - MongoDB
- GitLab CI
- Legacy code : maintenance - evolution - migration

02/2017 - 02/2021 **Engineer**, *Capgemini DEMS (Sogeti High Tech)*, Toulouse, France.

Java back-end developer and responsible for validation in an Agile team (Scrum) as Thales Alenia Space contractor, Toulouse, France.
- Building of a Java application based on microservices architecture:
  - Vert.x, Spring and Java 8 specificities;
  - Interactions with front-end (based on Angular 5) using REST API and Swagger;
  - Introduction to the use of RxJava;
  - Unit tests with JUnit, acceptance tests with Cucumber;
  - Database with PostgreSQL under pgAdmin 4, database schema changes application with Liquibase;
  - Code quality with SonarLint under Eclipse/IntelliJ IDEA, SonarQube coupled with Jenkins for continuous integration;

  - Git for VCS using Git Bash, Git Extensions, merge conflicts with IntelliJ IDEA, Beyond Compare or KDiff3, pull-requests and code review with Bitbucket;
  - Application deployment under SELinux platform with Ansible;
  - Modelization using Papyrus and Capella.
- Business needs analysis, feature test/validation, customer demonstration, support:
  - Needs analysis, refinement and feedback with the Product Owner (PO) or project engineering;
  - Functional tests writing (Cucumber), End-to-End tests writing and manual execution;
  - Feature validation in pre-production, demonstration for the PO;
  - Demonstration of the activities carried out by the team during the sprint, presentation of the sprint review;
  - Non-conformities handling (correction, validation of correction);
  - Product documentation update (technical documentation and user manual with Word, capitalization with RMsis);
  - Technical or functional skill transfer for new team members (developers or validators), functional support for team members.

R&D engineer for Capgemini DEMS (Sogeti High Tech), Toulouse, France.
- Building of C++ Plugins using FLTK as HCI and tests on various platforms (Windows 10, Ubuntu and Raspbian) using SVN for VCS.

Space physics engineering as Airbus Defense & Space contractor, Toulouse, France.
- Outgassing, thruster, radiation analyses and thruster modelisation using especially Systema products.

11/2015 - 07/2016 **Postdoctoral Fellow**, *Laboratoire de Physique Subatomique et de Cosmologie (LPSC)*, Grenoble, France (Head of working group : Sabine KRAML).

Development of programming tools for high energy physics phenomenology community, in C, C++ and Fortran.
- Two co-authored articles, published in Physical Review D and Computer Physics Communications;
- One national conference contribution as speaker.

10/2013 - 09/2015 **Postdoctoral Fellow as a Marie Skłodowska-Curie early stage researcher**, *The University of Manchester*, MCnet network, United Kingdom.
Head of working group : Michael SEYMOUR.

Tested a major update of the particle physics Herwig Event Generator, written in C++. Finalized successfully the implementation of a particle physics model (UMSSM) in the public code micrOMEGAs (C, Fortran).

- Two co-authored articles, published in Journal of High Energy Physics and Journal of Cosmology and Astroparticle Physics;
- Three national and international conference contributions as speaker;
- Three presentations as seminars in scientific laboratories.

2011 - 2012 (6 months) **CMIRA 2011 EXPLO'RA DOC Fellow**, *Institute for Particle Physics Phenomenology (IPPP)*, Durham University, United Kingdom (Supervisor : Céline BŒHM).

Development of programming methods in C to efficiently cover and analyse the parameter space of particle physics models.

- Two co-authored articles published in Physical Review D;
- Two national conference contributions as speaker;
- Three presentations as seminars in scientific laboratories.

10/2010 - 09/2013 **CNRS Fellow**, *Laboratoire d'Annecy-le-Vieux de Physique Théorique (LAPTh)*, Université de Grenoble, France (Advisor : Geneviève BÉLANGER).

Implemented, tested and analysed successfully particle physics models using existing programming tools (mostly in C).

- Two co-authored articles, published in Journal of Cosmology and Astroparticle Physics;
- One workshop and one proceedings contribution;
- Seven national and international conference contributions as speaker;
- Two poster contributions at international schools in particle physics;
- Two presentations as seminars in scientific laboratories.

## Education

10/2010 - 09/2013 **PhD in Theoretical Physics**, *Laboratoire d'Annecy-le-Vieux de Physique Théorique (LAPTh)*, Université de Grenoble, CNRS, France. Defended on july 3, 2013.

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| Thesis | *Supersymmetric Dark Matter candidates in light of constraints from collider and astroparticle observables*, `tel-00912650`, [`arXiv:1312.0257`]. |
| Advisor | Geneviève BÉLANGER. |

2010 **Master in Particle Physics and Cosmology**, *Université Montpellier 2*, France.

03 - 06/2010 **Second year Master intership**, *LAPTh*, France.

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| Title | *Dark matter in an extension of the standard model* |
| Supervisor | Geneviève BÉLANGER. |

05 - 06/2009 **First year Master intership**, *Laboratoire de physique théorique et astroparticules*, *Université Montpellier 2*, France.

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| Title | *Quarks model aud current algebra* |
| Supervisor | Stephan NARISON. |

2008 **Bachelor in Physics**, *Université Montpellier 2*, France.

2005 **High school diploma in sciences**, *Lycée François Arago*, Perpignan, France.

## Teaching

2013 - 2015 Teaching assistant (2 hours per week of teaching during term time) at *The University of Manchester*, United Kingdom, for groups of five undergraduate students in second year BSc at the *School of Physics and Astronomy* :

Assessment of presentations : vacation essays.

Tutorials : Maths of Waves and Fields, Electromagnetism, Quantum Mechanics, Wave Optics, Thermal and Statistical Physics.

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| 2010 - 2013 | Teaching assistant (192 hours over 3 years) at the *IUT Annecy, Université de Savoie*, France, and more precisely at the departments *Génie Électrique et Informatique Industrielle* and *Génie Mécanique et Productique* for various groups of around 15 undergraduate students in first or second year of the BSc equivalent : |

> Tutorials : Classical Physics.
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> Labs and assessment of reports : Mechanics and Acoustics, Optics, Electricity.

## Outreach

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| 13/03/2015 | Exhibitor at The Big Bang Fair 2015, The NEC Birmingham, United Kingdom. |
| 2010 - 2012 | Organization of local science event for general public "Fête de la Science", LAPTh, France. |

## Publications

8. D. Barducci, G. Bélanger, J. Bernon, F. Boudjema, J. Da Silva, S. Kraml, U. Laa and A. Pukhov, *Collider limits on new physics within micrOMEGAs_4.3*, `Comput. Phys. Commun. 222 (2018) 327-338`, [`arXiv:1606.03834`].

7. G. Bélanger, J. Da Silva and H. M. Tran, *Dark matter in U(1) extensions of the MSSM with gauge kinetic mixing*, `Phys. Rev. D 95 (2017) 115017`, [`arXiv:1703.03275`].

6. G. Bélanger, J. Da Silva, T. Perrillat-Bottonet and A. Pukhov, *Limits on dark matter proton scattering from neutrino telescopes using micrOMEGAs*, `JCAP 12 (2015) 036`, [`arXiv:1507.07987`].

5. G. Bélanger, J. Da Silva, U. Laa and A. Pukhov, *Probing U(1) extensions of the MSSM at the LHC Run I and in dark matter searches*, `JHEP 09 (2015) 151`, [`arXiv:1505.06243`].

4. C. Bœhm, J. Da Silva, A. Mazumdar and E. Pukartas, *Probing the Supersymmetric Inflaton and Dark Matter link via the CMB, LHC and XENON1T experiments*, `Phys. Rev. D 87 (2013) 023529`, [`arXiv:1205.2815`].

3. G. Bélanger, C. Bœhm, M. Cirelli, J. Da Silva and A. Pukhov, *PAMELA and FERMI-LAT limits on the neutralino-chargino mass degeneracy*, `JCAP 11 (2012) 028`, [`arXiv:1208.5009`].

2. D. Albornoz Vasquez, G. Bélanger, C. Bœhm, J. Da Silva, P. Richardson and C. Wymant, *The 125 GeV Higgs in the NMSSM in light of LHC results and astrophysics constraints*, `Phys. Rev. D 86 (2012) 035023`, [`arXiv:1203.3446`].

1. G. Bélanger, J. Da Silva, and A. Pukhov, *The Right-handed sneutrino as thermal dark matter in U(1) extensions of the MSSM*, `JCAP 12 (2011) 014`, [`arXiv:1110.2414`].

### Workshop

G. Brooijmans, B. Gripaios, F. Moortgat, J. Santiago, P. Skands, *et al., Les Houches 2011: Physics at TeV Colliders New Physics Working Group Report*, `arXiv:1203.1488`.

### Proceedings

J. Da Silva, *To connect supersymmetry and dark matter*, Contribution to the `JRJC 2011 proceedings`.

## Other experience

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| 21 - 26/07/2014 | Secretary duties at the 22st International Conference on Supersymmetry and Unification of Fundamental Interactions, The University of Manchester, United Kingdom. |
| 2012 | Member of the editorial board of the International Europhysics Conference on High Energy Physics (HEP2011). |
| 21 - 27/07/2011 | Secretary duties in the Astroparticle Physics session of HEP2011, Grenoble, France. |
| 2011 - 2012 | Deputy Representative of PhD students from LAPP and LAPTh, France. |
| 2007 | Computing and internet certificate (C2i) – level 1, Université Montpellier 2, France. |
| 2004 - 2010 | Responsible of invoicing for the limited liability company "DA SILVA tiler", Baho, France. |