

# CURRICULUM VITAE

JOÃO PEDRO DOS SANTOS

## Personal Information

**Birth date and place:** 19 May 1982, in Rio de Janeiro, Brazil.

**Current academic affiliation:** Sorbonne Université, Institut de Mathématiques de Jussieu – Paris Rive Gauche. 4, Place Jussieu, Paris, 75005, France.

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## Research Interests

Algebraic and arithmetic Geometry;  $D$ -modules in positive and mixed characteristic; differential Galois theory; fundamental group-schemes in algebraic Geometry; vector bundles; Tannakian categories; geometric aspects of representation theory.

## Education

**December 2014.** Habilitation à diriger des recherches. Université de Paris 6. Title of thesis: Manifestations algebro-géométriques du concept de groupe fondamental. Refereed by P. Berthelot (Rennes), Hélène Esnault (Berlin) and Ch. Pauly (Nice).

**October 2003–November 2006.** PhD, University of Cambridge, U.K. Thesis advisor: N.I. Shepherd-Barron (FRS). Title of the thesis: Fundamental Groups in Algebraic Geometry.

**October 2002–July 2003.** Certificate of Advanced Study in Mathematics, University of Cambridge, U.K.

**January 2000–January 2002.** Masters in Pure Mathematics, IMPA, Rio de Janeiro, Brazil. Advisor: C. G. Moreira.

**January 1998–December 2000.** German High School, Rio de Janeiro, Brazil.

## Employment

**September 2008–present.** Maître de Conférences, Université de Paris 6, Paris, France.

**October 2007–September 2008.** Invited researcher (post-doc), Max-Planck-Institut für Mathematik, Bonn, Germany.

**October 2006–September 2007.** Visiting researcher (post-doc) sponsored by the Arithmetic Algebraic Geometry Network, Rennes, France.

## Fellowships and distinctions

**September 2020–July 2021.** Temporary assignment to the CNRS (Research Leave) at the Institut de Mathématiques de Jussieu. Paris, France.

**January 2017–June 2017.** Temporary assignment to the CNRS (Research Leave) at the Institut de Mathématiques de Jussieu. Paris, France.

**September 2014–December 2014.** Temporary assignment to the CNRS (Research Leave) at the Institut de Mathématiques de Jussieu. Paris, France.

**July 2013.** Invited researcher in IMPA, Rio de Janeiro, Brazil.

**September 2012–December 2012.** Temporary assignment to the CNRS (Research Leave) at the Institut de Mathématiques de Jussieu. Paris, France.

**October 2007–September 2008.** Max-Planck-Gesellschaft Stipendium, Bonn, Germany.

**October 2006–September 2007.** Marie-Curie grant from the “Arithmetic Algebraic Geometry” programme, Rennes, France.

**October 2006–September 2007.** Rouse Ball studentship, Trinity College, Cambridge, U.K. (declined).

**October 2003–October 2006.** Internal Graduate Studentship, Trinity College, Cambridge, U.K.

**July 2003.** Tripos prize. Trinity College, Cambridge, U.K.

**October 2002–July 2003.** Studentship in Mathematics, Trinity College, Cambridge, U.K.

**August 2000–August 2002.** Grant from the Brazilian Research Council, Rio de Janeiro, Brazil.

### Invitations to international conferences as speaker

**September 2019.** Arithmetic and  $p$ -adic fundamental groups. Caen, France. Invited by Tuan Ngo Dac and Jerome Poineau.

**May 2019.** Thematic semester: Arithmetic, Geometry and Cryptography, Rennes, France. Invited by M. Romagny and D. Tossici.

**May 2017.** Workshop “Fundamental group schemes in Arithmetic Geometry”. Tuan-Chau, Vietnam. (Membre of the scientific committee.)

**December 2013.** “Fundamental Groups in Arithmetic and Algebraic Geometry” in Pisa, Italy. Invited by Niels Borne.

**July 2013.** “Workshop on Vector Bundles in Positive Characteristic” in Nice, France. Invited by Christian Pauly.

**May 2011.** “Sino-French Summer Institute in Arithmetic Geometry” in Tianjin, China. Invited by Lei Fu.

**April/May 2010.** “Bundles on Projective Varieties” in Bombay en India. Invited by Indranil Biswas.

**March 2010.** “Geometric and Differential Galois Theory” at the CIRM in Luminy, France. Invited by Pierre Dèbes.

**February 2010.** “The arithmetic of  $\pi_1$ ” in Heidelberg, Germany. Invited by Jakob Stix.

**September 2007.** “Final conference of the Arithmetic Algebraic Geometry Network” in Cetraro, Italy. Invited by Bruno Chiarellotto.

### References

Y. André (Paris, France), P. Berthelot (Rennes, France), I. Biswas (Bombay, India), H. Esnault (Berlin, Germany), Phung Ho Hai (Hanoi, Vietnam), Marius van der Put (Groningen).

### Languages

Fluent in German, English, French and Portuguese.

## Scientific Publications

Articles are also available on <http://webusers.imj-prg.fr/~joao-pedro.dos-santos/>

- dS20pb *On certain Tannakian categories of integrable connections over Kähler manifolds.* Avec I. Biswas, S. Dumitrescu and S. Heller. Preprint, May 2020.
- dS20pa *Regular singular connections on relative complex schemes.* With P. H. Hai. Preprint, February 2020.
- dS19a *Finite torsors on projective schemes defined over a discrete valuation ring .* With P. H. Hai. Preprint April 2019.
- dS18pb *On the fundamental group schemes of certain quotient varieties.* With I. Biswas and P. H. Hai. Preprint June 2018.
- dS18pa *On the structure of affine flat group schemes over discrete valuation rings, II.* With P. H. Hai. Preprint February 2018.
- dS18b *On the structure of affine flat group schemes over discrete valuation rings.* With N. D. Duong and P. H. Hai. Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) Vol. XVIII (2018), 977-1032  
DOI: 10.2422/2036-2145.201509\_004
- dS18a *The action of the étale fundamental group scheme on the connected component of the essentially finite one.* With P. H. Hai. Mathematische Nachrichten. 2018; 291:1733–1742 <https://doi.org/10.1002/mana.201600494>
- dS17 *Abelianization of the  $F$ -divided fundamental group scheme.* With I. Biswas. Proc. Indian Acad. Sci. Math. Sci. 127 (2017), no. 2, 281–287
- dS15 *The homotopy exact sequence for the fundamental group scheme and infinitesimal equivalence relations.* Algebraic Geometry 2 (5) (2015) 535–590 doi:10.14231/AG-2015-024.
- dS13 *Triviality criteria for vector bundles over rationally connected varieties.* With I. Biswas. Journal of the Ramanujan Mathematical Society (2013) Volume 28, no. 4, pp 423–442.
- dS12b *On the number of Frobenius-trivial sheaves on specific curves.* Arch. Math. Septembre 2012, Volume 99, Issue 3, pp 227-235.  
doi:10.1007/s00013-012-0424-9.
- dS12a *Vector bundles trivialized by proper morphisms and the fundamental group scheme II.* With I. Biswas. The Arithmetic of Fundamental Groups. PIA 2010. Contributions in Mathematical and Computational Sciences, Vol. 2. J. Stix (editor). Springer 2012.
- dS11b *Vector bundles trivialized by proper morphisms and the fundamental group scheme.* With I. Biswas. Journal of the Inst. of Math. Jussieu (2011) 10(2), 225–234  
doi:10.1017/S1474748010000071.
- dS11a *Lifting  $D$ -modules from positive to zero characteristic.* Bulletin de la Société Mathématique de France Tome 139 Fasc. 2, 2011, 145–286.
- dS09b *On the vector bundles over rationally connected varieties.* With I. Biswas. C. R. Math. Acad. Sci. Paris 347 (2009), no. 19-20, 1173–1176  
<http://dx.doi.org/10.1016/j.crma.2009.09.006>
- dS09a *The behaviour of the differential Galois group on the generic and special fibres: A Tannakian approach.* J. reine angew. Math. 637 (2009), 63–98.  
doi:10.1515/CRELLE.2009.091.
- dS08 *A note on stratified modules with finite integral differential Galois groups.* Preprint 2008.
- dS07c *Fundamental group schemes in positive characteristic.* Oberwolfach reports Volume 4, Issue 2, 1514–1516 (2007).

- dS07b *Fundamental group schemes for stratified sheaves.* Journal of Algebra, Volume 317, Issue 2, pp. 691–713 (2007).
- dS07a *Local solutions to positive characteristic non-Archimedean differential equations.* Compositio Mathematica 143 (2007) 1465–1477.

## Contributions to education through research

### *Supervision of doctoral theses.*

- (1) Hugo Bay-Rousson. Theme of thesis: *The concept of isomonodromy in algebraic geometry*. University of Paris 6. From 2015–2019.
- (2) Phan Than Tam. Theme of thesis: *The Hitchin correspondence in positive characteristic*. Institute of Mathematics, Vietnam Academy of Science and Technology. (Main supervisor: Phung Ho Hai.) From 2015–present.

### *Contributions to the formation of Ph.D. students.*

- (1) Jury member for the thesis of Yuliang Huang. Supervisor: M. Romagny. Université de Rennes, September 2019.
- (2) Referee for the thesis of Yuliang Huang. Supervisor: M. Romagny. Université de Rennes 1. June 2019.
- (3) Jury member for the thesis of M.Lara. Supervisor: H. Esnault. Freie Universität Berlin. February 2019.
- (4) Referee for the thesis of M. Lara. Supervisor: H. Esnault. Free Universität Berlin. January 2019.
- (5) Referee for the thesis of R. Mammeri. Supervisor: N. Borne. Université de Lille. December 2016.
- (6) Jury member for the thesis of R. Mammeri. Supervisor: N. Borne. Université de Lille. December 2016.
- (7) Jury member for the thesis of G. Zalamansky. Supervisor: M. Romagny. Université de Paris 6. July 2015.

### *Supervision of Master 2 theses.*

- (1) Archia Ghiasabadi, *Groupe fondamental en géométrie algébrique et théorème de pureté*. (The fundamental group in algebraic geometry and the purity theorem.) Sorbonne Université 2019. Paris, France. (Ph.D. candidate in Strasbourg, France.)
- (2) Hugo Bay-Rousson, *Étude de la nilpotence de la connexion de Gauss-Manin*. (Study on the nilpotence of the Gauss-Manin connection.) University of Paris 6, 2015. (Ph.D. from the Sorbonne Université, Paris, France.)
- (3) Manuel M. Angulo, *The Gauss-Manin connection in the de Rham cohomology sheaves*. University of Paris 6, 2013. (Ph.D. from the University of Ghent, Belgium.)
- (4) Ines Pinto, *the Hilbert scheme of curves in  $\mathbb{P}^3$* . University of Paris 6, 2012–13. (Abandoned.)
- (5) Ivan Barrientos, *The Gauss-Manin connection and regular singular points*. University of Paris 11 (ALGANT), 2009. (Ph.D. from the University of Regensburg, Germany.)