

## Marta Abril Bucero

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### CONTACT

#### INFORMATION

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### EDUCATION

**Ph.D., Mathematics**, University of Nice Sophia Antipolis - Inria Sophia Antipolis, France, 2011-2014

Thesis : “*Moments Matrices, Real algebraic geometry and polynomial optimization*”

Advisor : Bernard Mourrain.

PhD fellow in the ANR project : GEOLMI (Geometry and Algebra of Linear Matrix Inequalities with Systems Control Applications)

**M.Sc., Mathematics**, Universidad Complutense de Madrid, Spain, 2010-2011

Thesis : “*Normal Bundle of the Grassmannian  $G(k,n)$* ”

Advisor : Enrique Arrondo Esteban

**B.Sc., Mathematics**, Universidad Complutense de Madrid, Spain, 2001-2007

### RESEARCH POSITIONS

**01.2015–present**, Inria Sophia Antipolis, France

Collaborator-Postdoc – Galaad 2 Team.

**12.2011–12.2014**, University of Nice Sophia Antipolis / Inria Sophia Antipolis France

Ph.D. Fellow, Inria Sophia Antipolis , Galaad Team, within the ANR project GEOLMI.

### TEACHING EXPERIENCE

**Teaching Assistant**, University of Nice Sophia Antipolis, France

**2014** : Probability and Statistic, second year of Computer Sciences.

**2014** : Analysis 2, second year of Physics and Chemistry Sciences.

**2015** : Analysis, first year of Economics Sciences.

**Assistant-Collaborator**, International Congress of Mathematicians 2006, Madrid

**AGOST 2006** : Exposition : Por que las matematicas ? - Arte Fractal - Belleza y Demoscene .

### GRANTS AND AWARDS

- ANR GEOLMI Ph.D. Grant (2011-2014).
- Isaac Newton Institute of Mathematical Sciences Travel and Acomodation grant to attend the Polynomial Optimisation - Summer School and Workshop Cambridge, United Kingdom, July 15-19, 2013.

## PUBLICATIONS

1. *On the construction of general cubature formula by flat extension* (accepted 2015), M. Abril Bucero, C. Bajaj and B. Mourrain, Linear Algebra and its applications.  
<http://arxiv.org/abs/1506.00085>
2. *The borderbasix package* (2015), P. Trebuchet, B. Mourrain and M. Abril Bucero, MEGA 2015.
3. *Border Basis relaxation for polynomial optimization* (submitted 2014), M. Abril Bucero and B. Mourrain, Journal of symbolic computation.  
<http://hal.inria.fr/hal-00981546>
4. *New polynomial optimization algorithm using border basis* (2014), M. Abril Bucero and B. Mourrain, Proceedings Encuentro de Álgebra Computacional y Aplicaciones (EACA), Barcelona, June 2014 : 37-39.  
[http://www.ub.edu/eaca2014/2014\\_EACA\\_Conference\\_Proceedings.pdf](http://www.ub.edu/eaca2014/2014_EACA_Conference_Proceedings.pdf)
5. *Exact relaxation for polynomial optimization in semialgebraic sets* (submitted 2015), M. Abril Bucero and B. Mourrain.

## THESES

6. *Moments Matrices, Real algebraic geometry and polynomial optimization* (2014), Ph.D. Thesis, University of Nice Sophia Antipolis/ Inria,  
<http://www.theses.fr/2014NICE4118>.
7. *Normal Bundle of the Grassmannian  $G(k,n)$*  (2011), Master Thesis, Universidad Complutense de Madrid, <http://www.mat.ucm.es/invesmat/wp-content/uploads/2011/11/TFM-2010-11-Marta-Abril.pdf> (in Spanish).

RECENT  
CONFERENCE AND  
SEMINAR TALKS

*Border Basis Relaxation for polynomial optimization*, July 13-18, 2014 - IFORS 2014, Barcelona, Spain

*New polynomial optimization algorithm using border basis*, June 20, 2014 - EACA 2014 XIV Encuentro de Álgebra Computacional y Aplicaciones, Barcelona, Spain

*Global polynomial optimization with moment matrices and border basis*, July 17-19, 2013 - Polynomial optimization workshop - Isaac Newton Institute, Cambridge, United Kingdom

*A new method to compute the minimum of real polynomial function*, September 17-19, 2012 - Mathematics, Algorithms and Proofs, Konstanz, Germany

## COMPUTER SKILLS

- **High Knowledge of SDP software : SDPA, SDPA-GMP, CSDP, MOSEK**
- **C++**
- **Matlab**
- **Maple**
- **GeoGebra**
- **Java**
- **Prolog**

## LANGUAGE SKILLS

- **Spanish** : Mother Tongue
- **French** : C1
- **English** : B2