

ANA PEÓN-NIETO

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Universidad Politécnicade Cataluña ◊ Departamento de Matemáticas

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PERSONAL INFORMATION

Name and surname: Ana Peón-Nieto.

Date of birth: 21/02/1983

Place of birth: La Coruña, Spain

Nationality: Spanish

Children: One, born 30/10/2016

EDUCATION

PhD, Universidad Autónoma de Madrid

2009 - 2013

Higgs bundles, real forms and the Hitchin fibration.

Advisors: O. García-Prada and Luis Álvarez-Cónsul.

Funded by a scholarship “FPU”, Ministerio de Educación.

PhD Studies, Université Paris 7 Denis-Diderot

2007-09

Scientific re-orientation: 2009

Théorie des modèles et applications à lalgèbre différentielle et aux différences.

Advisor: Zoé Chatzidakis.

Funded by a scholarship “Allocation de recherche”, Ministère de l’Éducation.

Master M2 Mathématiques fondamentales, Université Paris 7 Denis-Diderot

2006-2007

Théorie des modèles et géométrie réelle.

Advisor: Max Dickmann.

Funded by a scholarship “Fundación Caixa Galicia”.

Licenciatura en Matemáticas (MSc) Universidad Autónoma de Madrid

2002-2006

WORK EXPERIENCE

Universidad Politécnicade Cataluña

01/11/19-present

Beatriu de Pinós research fellow

Mentor: E. Miranda

Université de Genève

01/03/18-30/10/19

Maître-assistante (01/08/19-30/10/19) and Postdoc (01/03/18-31/07/18)

Mentor: A. Szenes

Université de Nice

01/05/17-31/10/17

Postdoctoral researcher

Mentor: C. Pauly

Ruprecht-Karls Universität Heidelberg

01/01/14-31/12/16

Postdoctoral researcher

Mentor: A. Wienhard

Career breaks:

Maternity leave

Maternity leave

September 2016–April 2017

November 2017–February 2018

RESEARCH INTERESTS

Algebraic and differential geometry. Moduli spaces and stacks of Higgs bundles. The Hitchin map. Relations with physics, the geometric Langlands programme, representation varieties and geometric structures.

PUBLICATIONS AND PREPRINTS

Higgs bundles for real groups and the Hitchin–Kostant–Rallis section (with *O. García-Prada* and *S. Ramanan*). *Trans. Amer. Math. Soc.* 370, (4), 2907–2953 (2018). Preprint, arXiv:1511.02611[math.AG].

Very stable bundles and properness of the Hitchin map (with *C. Pauly*). *A. Geom. Dedicata* (2018). DOI: 10.1007/s10711-018-0333-6. Preprint, arXiv:1710.10152 [math.AG].

Symplectic geometry of a moduli space of framed Higgs bundles (with *I. Biswas* and *M. Logares*). *Int. Math. Res. Notices* (2019) DOI: 10.1093/imrn/rnz016. Preprint, arXiv:1805.07265 [math.AG]

Moduli spaces of framed G-Higgs bundles and symplectic geometry (with *I. Biswas* and *M. Logares*). *Commun. Math. Phys* (2019) <https://doi.org/10.1007/s00220-019-03531-3>. Preprint, arXiv:1902.06490 [math.AG].

Fixed bundles, singular loci and mirror symmetry. To appear in *Oberwolfach Reports* (EMS, DOI: 10.4171/OWR). Preprint: arXiv:1907.04903.

On $\sigma\delta$ -Picard–Vessiot extensions. *Communications in Algebra* 34, 4 (2011), 1242–1249.

Higgs bundles, real forms and the Hitchin fibration PhD thesis. Universidad Autónoma de Madrid, 2013. <https://repositorio.uam.es/handle/10486/660220>

The Borel subgroup and branes on the Higgs moduli space (with *E. Franco*). Preprint, arXiv:1709.03549v2 [math.AG]

Unramified covers and branes on the Hitchin system (with *E. Franco*, *P. Gothen* and *A. Oliveira*). Preprint, arXiv:1802.05237 [math.AG]

Cameral data for $SU(p, p+1)$ -Higgs bundles. Preprint, arXiv: 1506.01318 [math.AG]

Higgs bundles, abelian gerbes and cameral data (with *O. García-Prada*). Preprint, arXiv:1902.06139

Articles in preparation:

- Narasimhan–Ramanan branes in rank two (with *E. Franco*, *P. Gothen* and *A. G. Oliveira*)

- Symplectic geometry of moduli spaces of parabolic bundles (*with I. Biswas, M. Logares and S. Szábo*)
- Equality of the wobbly and shaky loci: the regular case.
- Quantization of $SU(2)$ character variety: from real polarizations to branes.

SCHOLARSHIPS AND GRANTS

Beatriu de Pinós Grant

2019–22

- 144.300 euros for salary and project related expenses
- Funding entity: European Council and Generalitat de Catalunya

Juan de la Cierva Incorporación Grant

2020–23

- 93.000 euros for salary and project related expenses.
- Funding entity: Ministerio de Ciencia y Competitividad

Hengstberger Prize

2014

- 12.500 euros to organize a conference.
- Funding entity: IWH Foundation Heidelberg.

MATCH postdoctoral fellowship

2014–15

- Postdoctoral grant covering salary.
- Funding entity: University of Heidelberg

Beca FPU

2009–13

- PhD scholarship.
- Funding entity: Ministerio de Ciencia y Competitividad.

Allocation de recherche

2007–10

- PhD scholarship.
- Funding entity: Ministère de l'Éducation.

Beca para estudios de master en centros de reconocido prestigio

2006–07

- Master scholarship.
- Funding entity: Fundación Caixa Galicia

Short stay grants:

- GEAR Network Summer REGS internship. UPenn, Philadelphia. 1 week, August 2013.
- GEAR Network Graduate internships. UPenn, Philadelphia. January–March 2013.
- GEAR Network Graduate internships. UPenn, Philadelphia. 2 weeks, July 2012.
- Beca FPU estancias cortas. UPenn, Philadelphia. January–May 2012.
- Beca FPU estancias cortas. Isaac Newton Institute, Cambridge. January–March 2011

Other:

- Beca de colaboración UAM 2005 (development of computational exercises for the advanced course Criptografía)
- ERASMUS Scholarship 2004/05. Agence Européene Ministerio de Educación UAM.
- Resignation for incompatibility reasons: Italian government scholarship for PhD studies (University of Pisa, 2007/10); beca FPI (Universidad Complutense de Madrid, 2007/11); beca La Caixa for Master Studies 2006/07, beca CSIC Iniciación a la investigación 2006/07; Marie Curie PhD grant (University of Leeds, 2006/08).

INVITED CONFERENCES AND WORKSHOPS

- Málaga & Topology Meeting** *February 2020*
TBA. Málaga, Spain.
- ISAAC 2019. Special Session on Complex Geometry** *June 2019*
Mirror symmetry on some non generic loci of the Hitchin system. Aveiro, Portugal.
- Geometry and Physics of Higgs bundles.** *May 2019*
Fixed point branes, singular loci and mirror symmetry. Oberwolfach, Germany.
- Projet Jeunes Géomètres Workshop. Harmonic Maps and Rigidity.** *April 2019*
Construction of arithmetic lattices. Sisteron, France.
- Women at the Intersection of Geometry and High Energy Physics** *February 2019*
Hitchin systems in geometry and physics. Geneva, Switzerland.
- New trends in Higgs bundle theory** *November 2018*
Branes on the Hitchin system from torsion line bundles. ICMAT, Madrid.
- Higgs Bundles in Geometry and Physics** *February 2016*
Mirror symmetry for Cartan branes. Heidelberg, Germany.
- VBAC 2016–Higgs Bundles and the Hitchin System** *January 2016*
A cameral construction for Higgs bundles for quasi-split real groups. EPFL, Switzerland.
- Fifty Years of the Narasimhan-Seshadri Theorem** *October 2015*
Higgs bundles for real groups and the Hitchin map. CMI, Chennai, India.
- Current trends on spectral data for Higgs bundles** *September 2015*
Higgs bundles for quasi-split real groups and the Hitchin map. AIM, San Jose, USA.
- 2015 Joint International Meeting with the AMS, the EMS, and the SPM.** *June 2015*
Special session on Higgs bundles and character varieties.
Quasi-split real groups and the Hitchin map. Universidade do Porto, Portugal.
- Geometric structures and representation varieties** *November 2014*
Mini-course Connected components of representation varieties. KIAS, Seoul.
- Geometry and Physics of Moduli Spaces** *June 2014*
Higgs bundles and abelianization. ICMAT, Madrid.
- Second Junior Gear Retreat** *May 2014*
Higgs bundles and abelianization. University of Michigan in Ann Arbor.
- Hitchin Lab Retreat** *March 2013*
The Hitchin fibration and real forms through cameral covers. ICMAT, Madrid.

INVITED SEMINARS

- Universidad Politécnica de Cataluña.** Seminario de Geometría Algebraica *February 2020*
TBA
- Université Paris 6.** Séminaire d'algèbre *December 2019*
Fibrés très stables, symétrie miroir et le programme de Langlands géométrique
- Universidade do Porto.** Seminario de Geometria. *October 2019*
Wobbly and shaky bundles in geometric Langlands
- Universidad de Santiago de Compostela** *June 2019*
Geometría de los sistemas de Hitchin

- Université de Fribourg** *December 2018*
A criterion for very stability via the Hitchin map.
- Université de Genève.** Séminaire de la Tortue *April 2018*
Mirror symmetry and branes on the singular locus of the Hitchin system.
- Université d'Orsay.** Séminaire GAGA *February 2018*
Symétrie miroir topologique et branes dans le système de Hitchin.
- Universidad de Salamanca.** Seminario de Geometría Algebraica *January 2018*
Simetría del espejo topológica y branas en el sistema de Hitchin.
- Université de Nice.** Séminaire de Topologie, Algèbre et Géométrie *October 2017*
Sous-groupes paraboliques et branes sur le site singulier du système de Hitchin.
- Universidad Central de Barcelona.** *April 2016*
Mirror symmetry for Cartan branes.
- Universidade do Porto.** Seminario de Geometria *March 2016*
Mirror symmetry for Cartan branes.
- Universidade do Porto.** Reading Group in Geometry *March 2016*
Higgs bundles and abelianization.
- Goethe Universität Frankfurt.** Hauptseminar Analyse *February 2016*
 $SU(p+1, p)$ -Higgs bundles and the Hitchin map.
- IRM, Université de Rennes.** Séminaire de Géométrie Algébrique *December 2015*
Une construction camérale pour des fibrés de Higgs associés à des groupes réels.
- Laboratoire Paul Painlevé, Université de Lille** *April 2015*
Fibrés de Higgs, groupes réels et le système de Hitchin.
- Université d'Aix Marseille.** Séminaire d'Analyse, Topologie et Probabilités *March 2015*
Fibrés de Higgs, groupes réels et le système de Hitchin.
- Université de Nice** *March 2015*
Fibrés de Higgs, groupes réels et le système de Hitchin.
- Université de Strasbourg.** Séminaire GT3 *November 2014*
Fibrés de Higgs, groupes réels et et la section de Hitchin–Kostant–Rallis.
- Center for symmetry and representations, University of Copenhagen** *April 2014*
Abelianization of Higgs bundles.
- Universidad Complutense de Madrid.** Seminario de Geometría *December 2013*
Fibrados de Higgs, formas reales y gavillas.
- Universidad Autónoma de Madrid.** *December 2013*
Fibrados de Higgs, formas reales y la aplicación de Hitchin.
- Universität Heidelberg.** Hauptseminar Geometrie. *July 2013*
Higgs bundles, real forms and cameral covers.
- University of Pennsylvania in Philadelphia.** Math/Physics Seminar *July 2013*
Higgs bundles, real forms and cameral covers.

OTHER SEMINARS AND ACTIVITIES

VBAC 2018 <i>Poster: Parabolic subgroups and branes on the singular locus of the Hitchin system.</i> CIRM, Marseille.	<i>June 2018</i>
Reading group Abelianization and the Hitchin fibration <i>The universal centralizer group scheme I and II.</i> Universität Heidelberg.	<i>June 2016</i>
Workshop Differentialgeometrie im Großen Mathematisches Forschungsinstitut Oberwolfach, Germany.	<i>June 215</i>
What is...? Seminar. Universität Heidelberg. <i>What is a boson/fermion?</i> Junior Seminar	<i>May 2014</i>
Gear Retreat, University of Maryland <i>Presentation of the poster: Abelianization of Higgs bundles</i>	<i>March 2014</i>
What is...? Seminar. Universität Heidelberg <i>What is a gerbe?</i> Junior Seminar	<i>January 2014</i>
Toric seminar, UPenn, Philadelphia <i>Mirror symmetry and toric geometry</i>	<i>May 2012</i>
Pizza seminar, UPenn, Philadelphia <i>GIT: the quest for P^n.</i> Junior Seminar	<i>April 2012</i>
Séminaire des thésards de géométrie. Université Paris 7 <i>Théorie des modèles et applications à l'algèbre.</i> Junior Seminar	<i>June 009</i>
Séminaire des thésards de logique. Université Paris 7 <i>Variétés algébriques vs. variétés analytiques.</i> Junior Seminar	<i>May 2009</i>

RESEARCH STAYS ABROAD

Universidade do Porto	<i>December 2017</i>
Universidade do Porto	<i>July 2017</i>
Universidade do Porto	<i>March 2016</i>
MRSI Berkeley	<i>January 2015</i>
University of Singapore	<i>July 2014</i>
UPenn, Philadelphia	<i>August 2013</i>
UPenn, Philadelphia	<i>January–March 2013</i>
UPenn, Philadelphia	<i>July 2012</i>
UPenn, Philadelphia	<i>January–May 2012</i>
Isaac Newton Institute, Cambridge	<i>January–March 2011</i>

HONORS AND AWARDS

Prizes and awards

- Klaus-Georg und Sigrid Hengstberger Prize for Young Scientists 2014, Universität Heidelberg. Consisting on 12500 euros to organize a conference.
- Premio extraordinario de Licenciatura 2006 to the best Msc diploma of the year in Mathematics. Universidad Autónoma de Madrid.

Invitation only events

- Invitation to speak at the round table of the workshop “Ciencia y la Ficción en el mundo Hispánico”, Université de Lausanne, November 2019 (declined for impediment).
- Oberwolfach Workshop Geometry and Physics of Higgs bundle moduli spaces. MFO Oberwolfach, May 2019.
- Workshop Projet Jeunes Géomètres “Harmonic Maps and Rigidity”.
- Oberwolfach workshop Differentialgeometrie im Großen”, MFO Oberwolfach, June 2015.
- Participation at the Heidelberg Laureate Forum. Heidelberg, 20-26th September 2014.

PARTICIPATION IN RESEARCH PROJECTS

Dimensional reduction of Spin(7)-instantons

September 2020–August 2023

Role: PI

Funding entity: Ministerio de Ciencia e Investigación

Project: Juan de la Cierva-Incorporación grant n. IJC2018-035023-I

Total amount: 6000 euros

Geometry and Physics of Higgs Bundles

November 2019–October 2022

Role: PI

Funding entity: European Council and Generalitat de Catalunya

Project: Marie Curie FP7-PEOPLE-COFUND-2008 grant n. 2018 BP 00332

Total amount: 12000 euros

Geometry of Manifolds and Applications

2019–2020

Role: Postdoctoral researcher

Funding entity: AGAUR

Project: GEOMVAP 2017 SGR 932

SwissMAP, The Mathematics of Physics

March 2018–September 2019

Role: Postdoctoral researcher

Funding entity: Fonds National de la Recherche, Switzerland.

Total amount: 23,000,000 CHF in the first out of 3 phases

Geometry of algebraic varieties

2016–18

Role: External collaborator

Funding Entity: Fundação para a Ciência e a Tecnologia, Portugal

Project: PTDC/MATGEO/2823/2014

Total amount: 130,833.00 euros

GEOMODULI

March–October 2017

Role: Postdoctoral researcher

Funding Entity: European Comision.

Project: F7-PEOPLE-2013 CIG no. 618471

Total amount: 100.000 euros

Geometría de Espacios de Moduli

2010–13

Role: PhD student

Funding entity: Ministerio de Ciencia e Innovación, Spain
Project: MTM2010-17717
Total amount: 134.000 euros

MTM2007-67623

2009–10

Role: PhD student

Funding entity: Ministerio de Ciencia e Innovación, Spain

TEACHING

Lie Theory

April 2020

Center: Universidad Politécnica de Cataluña

Level: Master

Studies: Mathematics

Type: theoretical classes

Number of hours: 8 (of classroom participation)

Activities: preparation and delivery of lectures

Simpson's correspondence: the abelian case

January 2020

Center: Universidad de Santiago de Compostela

Level: PhD

Studies: Mathematics

Type: theoretical classes

Number of hours: 20 (of classroom participation)

Activities: design of the course and delivery of lectures

Analyse complexe II

September 2018–June 2019

Center: Université de Genève

Level: 2nd year Bachelor

Studies: Mathematics/Physics

Type: problem classes

Number of hours: 226 (including all the activities specified below)

Activities: preparation and delivery of lectures

Analyse complexe II

March 2018–June 2018

Center: Université de Genève

Level: 2nd year Bachelor

Studies: Mathematics/Physics

Type: problem classes

Number of hours: 113 (including all the activities specified below)

Activities: preparation and delivery of lectures, grading exercises

Lie algebras and representations

September 2014–January 2015

Center: Ruprecht Karls Universität Heidelberg

Level: 3rd year Bachelor/Master

Studies: Mathematics/Physics

Type: theoretical

Number of hours: 60 (of classroom participation)

Activities: design of the course, preparation and delivery of lectures,

grading exercises, supervision of students to prepare talks

Algebraic Geometry for Physicists

October 2014

Center: Ruprecht Karls Universität Heidelberg

Level: Master/PhD

Studies: Physics

Type: theoretical

Number of hours: 15 (of classroom participation)

Activities: design of the course, preparation and delivery of lectures

Matemáticas I

September 2011–January 2012

Center: Universidad Autónoma de Madrid.

Level: 1st year BsC

Studies: Chemical Engineering

Type: problems

Number of hours: 30 (of classroom participation)

Activities: preparation and delivery of lectures

Matemáticas I

September 2012–January 2013

Center: Universidad Autónoma de Madrid.

Level: 1st year BsC

Studies: Chemical Engineering

Type: problems

Number of hours: 30 (of classroom participation)

Activities: preparation and delivery of lectures

Analyse et Algèbre de base

September 2007–January 2008

Center: Université Paris 7 DenisDiderot

Level: 1st year BsC

Studies: Physique

Type: problems

Number of hours: 64 (of classroom participation)

Activities: preparation and delivery of lectures

Analyse et Algèbre de base

September 2008–January 2009

Center: Université Paris 7 DenisDiderot

Level: 1st year BsC

Studies: Physique

Type: problems

Number of hours: 64 (of classroom participation)

Activities: preparation and delivery of lectures

SERVICE AND ORGANISATION

Organiser of the Jíbiri workshop “Resolution of singularities”

July 2020

Universidad Politécica de Barcelona.

Organiser of the reading group “Perverse sheaves”

October 2018–January 2019

Université de Genève.

Organiser of the conference “Higgs bundles and related topics” Université de Nice.	<i>May 2017</i>
Organiser of the summer school “Hitchin Fibrations, Geometric Langlands and Nonabelian Hodge Theory” , Universität Heidelberg.	<i>August 2016</i>
Organiser of the reading group “Abelianization and the Hitchin fibration” Universität Heidelberg.	<i>February–July 2016</i>
Organiser of the Hauptseminar Geometrie Universität Heidelberg	<i>January–July 2014</i>
Organiser of the What is...? Seminar Universität Heidelberg	<i>January 2014–December 2016</i>
Organiser of the conference Higher Teichmüller theory: interactions and new trends. IWH Heidelberg	<i>November 2015</i>
Talk Differentialgeometrie at MATCH Presentation at the Heidelberg Laureate Forum	<i>September 2014</i>
Member of the Mentoring Programme for Schoolgirls in Science Heidelberg University	<i>2014–2016</i>
Referee for the journals: Geom. Dedicata, Int. J. Math.	
International Mathematical Olympiad. Exam invigilator	<i>July 2008</i>
International Congress of Mathematicians. Registration desk	<i>August 2006</i>
Student representative at the department council	<i>2004/05</i>

OUTREACH

Open days , Heidelberg Institute for Theoretical Studies Script of the workshop “Soap Bubbles and Minimal Surfaces”.	<i>July 2016</i>
Network for Schoolgirls in Science , Heidelberg University Member of the mentoring programme.	<i>2014-16</i>
Radio Interview “A hombros de gigantes”, Radio 3	<i>July 2013</i>
Semana de la Ciencia Workshop “Soap bubbles” , U. Autónoma de Madrid	<i>March 2010</i>
Member of the group “Les Maths Magiques” Development of workshops at primary and secondary schools. Université Paris 6-7.	<i>2007/09</i>
Semana de la ciencia Origami workshop. IFEMA, Madrid.	<i>March 2003</i>
TA at the programme ESTALMAT Programme aimed at mathematically talented kids under 12.	<i>2005</i>

LANGUAGES

Spanish (Mother tongue)
English (Fluent; TOEFL Computer based 2006. 277/300; C2 certificate from the German-American Institute Heidelberg)

French (Fluent; DALF C1)

Italian (Fluent)

German (Intermediate)

Arabic (Basic)