

CV Date	19/07/2023
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## Part A. PERSONAL INFORMATION

First Name	Sara		
Family Name	Arganda Arganda Carreras		
Sex	Female	Date of Birth	20/09/1980
ID number Social Security, Passport	53011621W		
URL Web	<a href="https://sites.google.com/view/saraarganda">https://sites.google.com/view/saraarganda</a>		
Email Address	sarijuela@gmail.com		
Open Researcher and Contributor ID (ORCID)	0000-0002-9875-2379		

### A.1. Current position

Job Title	Assistant Professor		
Starting date	2023		
Institution	Universidad Rey Juan Carlos		
Department / Centre			
Country	Spain	Phone Number	
Keywords	Natural sciences and health sciences		

### A.2. Previous positions (Research Career breaks included)

Period	Job Title / Name of Employer / Country
2018 - 2023	Postdoctoral researcher (Atracción de Talento Program, CAM, Modalidad I) / Universidad Rey Juan Carlos
2015 - 2018	Postdoctoral Researcher / Centre National de la Recherche Scientifique / France
2014 - 2015	Visiting Scholar / Boston University / United States of America
2014 - 2014	Visiting Scholar / Université Paul Sabatier / France
2012 - 2014	Postdoctoral Researcher / Centre National de la Recherche Scientifique / France
2009 - 2011	Postdoctoral Researcher / Insituto Cajal (CSIC-Madrid) / Spain
2009 - 2009	Postdoctoral Researcher / Departamento de Física Teórica (UAM) / Spain
2003 - 2009	PhD student / Departamento de Física Téorica (UAM) / Spain
2002 - 2003	Student Collaborator / Universidad Autónoma de Madrid

### A.3. Education

Degree/Master/PhD	University / Country	Year
Neurosciences (Departamento de Anatomía, Histología y Neurociencia, UAM)	Universidad Autónoma de Madrid / Spain	2009
Diploma in Advance Studies	Universidad Autónoma de Madrid	2005
Bachelor's Degree in Biological Sciences, specialized in Molecular Biology and Biochemistry	Universidad Autónoma de Madrid	2003

## Part B. CV SUMMARY

In February 2023 I started as Assistant Professor at the URJC, where I develop my research as a PI since 2018. I combine nutritional, physiological, neurobiological and computational tools with behavioral experiments to understand the adaptations of individuals to group living. I have perform my research activity in Spain, France and the U.S.A in the following lines:

**1) Neurobiology of invertebrates:** neural codes and their adaptation in sensory neurons, dynamic-clump methods and neural regeneration; **2) Decision-making and collective**

**behavior:** use of social information in fish and ants, and development of automatic tracking system for videos of groups of animals moving; **3) Insect nutrition:** Nutrition, longevity and behavior in ants and termites; **4) Miniaturized brains:** Cognition and brain anatomy and metabolism in ants; and **5) Immune system in social insects:** Study of the interrelation between nutrition, behavior and immune system in ant societies. These different research lines have provided me with an uncommon skill set from electrophysiological technics to neuroethological or nutritional tools. My contributions to the generation of knowledge in these fields are reflected in my publications and obtained grants and awards. **Quality indicators:** 16 peer-reviewed articles (12 in Q1 journals according to Scopus: Nat Neurosci, Nat Methods, PNAS, Proc R Soc B, Anim Behav, Curr Opin Insect Sci, Front Syst Neurosci, Front Ecol Evol, J Comp Physiol, PLoS One, J Insect Physiol and Funct Ecol), 1 article in conference proceedings (IEEE Signal Processing Society), 1 article in an online encyclopedia, 1 editorial and 1 patent. My work and collaborations have been presented in 31 national and international scientific meetings. I have participated in 16 research projects (4 as PI and 2 as coordinator of person under contract). Google Scholar factor H: 11, i10: 11, 1222 citations. **Grants and awards:** Collaboration grant for senior students (2002/03), grant for stays abroad (2005), conference grant (2008), Extraordinary PhD Award (2009), Marie Skłodowska-Curie Individual Fellowship (2015/18; 246668.40 €, research funds: 28800.00 €); Postdoc Seed Funding Award (2016; \$5000); Aid for Talent Attraction-CM, Modality I, 2017 (2018/22; 308150.00€, research funds: 198150.00 €); Aid for the recruitment of predoctoral and postdoctoral researchers of the CM-Empleo Joven (2019/20; 26650.00 €); Research Assistants and Laboratory Technicians, European Social Fund, YEI Program (2019/21; 45750.0 €); Generation of Knowledge, MICINN (2022/23; 121000,0 €); Aid for Talent Attraction-CM - 5th year, Modality I, 2017 (2022/23; 55000.00€, research funds: 30000.00 €); Impulso 2023 (Programa Propio, URJC, 6.325,42 €) **Staff and young researchers supervision:** 2 postdocs, 1 technician, 1 predoctoral student for one year, 7 undergraduate theses, 10 master's theses, 6 internship students. I get involved in their professional development of my mentees, for what I hold periodical meetings to help them and discuss their professional plans, additionally with many of them I have publications or manuscripts to be published.

**Teaching:** 416 h in bachelor's and master's degree courses. **Continuous learning** (attended): More than 150 h in specialized research course and teaching methodologies. **Outreach:** Participation in activities for schools, science fairs and exhibitions. Translation of ~30 articles for "Investigación y Ciencia" and "Mente y Cerebro" and 1 popular science article.

**International stays:** 6 weeks in the lab of M. Juusola (UK), 12 weeks in the lab of C. Sahley (USA), 2 years in the lab of A. Dussutour (France), 10 months in the GREPHE group (France), 3 years in the lab of J. Traniello (USA), and 3 months in the group of M. Giurfa (France).

**Review of scientific studies:** Reviewer for several scientific journals, evaluator of projects for the National Science Foundation (USA) and for applications for Technical Support Staff (2020) and Proyectos de Generación de Conocimiento 2021 for the State Research Agency (Spain). **More information:** ORCID: 0000-0002-9875-2379, ResearcherID: B-2200-2017

## Part C. RELEVANT ACCOMPLISHMENTS

### C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 Scientific paper.** Sara Arganda (AC); Ignacio Arganda-Carreras; Darcy G. Gordon; Andrew P. Hoadley; Alfonso Pérez-Escudero; Martín Giurfa; James F.A. Traniello. (1/7). 2022. Statistical Atlases and Automatic Labeling Strategies to Accelerate the Analysis of Social Insect Brain Evolution. *Frontiers in Ecology and Evolution - Social Evolution*. *Frontiers*. 9. ISSN 2296-701X. <https://doi.org/10.3389/fevo.2021.745707>

- 2 **Scientific paper.** Sofia Bouchebti; Fernando Cortés-Fossati; Ángela Vales Estepa; María Plaza Lozano; Daniel S. Calovi; Sara Arganda. (6/6). 2022. Sex-Specific Effect of the Dietary Protein to Carbohydrate Ratio on Personality in the Dubia Cockroach. *INSECTS*. MPDI. 13-2, pp.133. <https://doi.org/10.3390/insects13020133>
- 3 **Scientific paper.** Sara Arganda (AC); Andrew P. Hoadley; Evan S. Razdan; Isabella B. Muratore; James F. A.(1/5). 2020. The neuroplasticity of division of labor: worker polymorphism, compound eye structure and brain organization in the leafcutter ant *Atta cephalotes*. *Journal of Comparative Physiology A*. Springer. 206, pp.651-662. <https://doi.org/10.1007/s00359-020-01423-9>
- 4 **Scientific paper.** Poissonnier, Laure-Anne; Arganda, Sara; Simpson, Stephen J.; Dussutour, Audrey; Buhl, Jerome. (2/5). 2018. Nutrition in extreme food specialists: an illustration using termites. *Functional Ecology*. 32-11, pp.2531-2541. <https://doi.org/10.1111/1365-2435.13200>
- 5 **Scientific paper.** Sara Arganda (AC); Sofia Bouchebti; Sepideh Bazazi; Sophie Le Hesran; Camille Puga; Gérard Latil; Stephen J Simpson; Audrey Dussutour. (1/8). 2017. Parsing the life-shortening effects of dietary protein: effects of individual amino acids. *Proceedings of the Royal Society B: Biological Sciences*. The Royal Society. 284-1846, pp.20162052. ISSN 0962-8452. <https://doi.org/10.1098/rspb.2016.2052>
- 6 **Scientific paper.** Sara Arganda; Nicolis C. Stamatios; Anouk Perrochain; Christelle Pechabadens; Gérard Latil; Audrey Dussutour. (1/6). 2014. Collective choice in ants: The role of protein and carbohydrates ratios. *Journal of insect physiology*. 69, pp.19-29. ISSN 0022-1910. Google Scholar (10) <https://doi.org/10.1016/j.jinsphys.2014.04.002>
- 7 **Scientific paper.** Alfonso Pérez-Escudero; Julian Vicente-Page; Robert Hinz; Sara Arganda; Gonzalo G. de Polavieja. (4/5). 2014. idTracker:Tracking individuals in a group by automatic identification of unmarked animals. *Nature Methods*. 11, pp.743-748. ISSN 1548-7091. Google scholar (88) <https://doi.org/10.1038/nmeth.2994>
- 8 **Scientific paper.** Sara Arganda; Alfonso Pérez-Escudero; Gonzalo G. de Polavieja. (1/3). 2012. A common rule for decision-making in animal collectives across species. *Proceedings of the National Academy of Sciences*. 10-50, pp.20508-20513. ISSN 0027-8424. Google Scholar (61) <https://doi.org/10.1073/pnas.1210664109>
- 9 **Scientific paper.** Sara Arganda; Raul Guantes; Gonzalo G de Polavieja. (1/3). 2007. Sodium pumps adapt spike bursting to stimulus statistics. *Nature Neuroscience*. Nature Group. 10-11, pp.1467-1473. ISSN 1097-6256. <https://doi.org/10.1038/nn1982>
- 10 **Bibliographic review.** Sofia Bouchebti; Sara Arganda. 2020. Insect lifestyle and evolution of brain morphology. *Current opinion in insect science*. Elsevier BV. <https://doi.org/10.1016/j.cois.2020.09.012>

## C.2. Conferences and meetings

- 1 Sofia; Jana; Audrey; Fernando; Eva; Sara. Effect of dietary P:C ratio and amino acid ingestion in *Crematogaster scutellaris* ant behaviour. THE INTERNATIONAL CONGRESS OF NEUROETHOLOGY 2022. International Society of Neuroethology. 2022. Portugal.
- 2 María Eugenia; Celia; Fernando; Jana; Sara. How does the lack of hibernation affect ant colonies?. 19TH CONGRESS OF THE INTERNATIONAL UNION FOR THE STUDY OF SOCIAL INSECTS. International Union for the Study of Social Insects. 2022. United States of America. 'Participatory - poster.
- 3 Pablo Gómez del Campo; Diego Marcos; Sara Arganda; Tatiana Alieva; Margarita Chevalier. X-ray micro-CT morphology analysis of ant's head: experimental condition optimization. OSA Imaging and Applied Optics Congress. The Optical Society. 2020. Canada. 'Participatory - poster.
- 4 Dajia Ye; Sara Arganda; Zachary Coto; James S Waters; Marla Tipping; James Traniello. Diet, Nutritional Stress, and Brain Metabolism in Ants. 2018 ESA, ESC and ESBC Joint Annual Meeting. Crossing borders: Entomology in a changing world.. Entomological Society of America, Entomological Society of Canada and Entomological Society of British Columbia. 2018. Canada. 'Participatory - poster.
- 5 Sara Arganda. Geometrical framework applied to ant nutrition. Sfecologie2018 International Conference on Ecological Sciences. Sfecologie. 2018. France. Conference.

- 6 Sara Arganda; Andrew P. Hoadley; Isabella B. Muratore; Evan S. Razdan; James F.A. Traniello. Division of labor in darkness and in light: adaptive visual system evolution in *Atta cephalotes*. International Union for the Study of Social Insects - IUSSI2018. International Union for the Study of Social Insects. 2018. Brazil. Participatory - oral communication. Conference.
- 7 Ignacio Arganda-Carreras; Darcy G. Gordon; Sara Arganda; Maxime Beaudoin; James F.A. Traniello. Group-wise 3D registration based templates to study the evolution of ant worker neuroanatomy. IEEE International Symposium on Biomedical Imaging. IEEE Signal Processing Society (SPS) and the IEEE Engineering in Medicine and Biology Society (EMBS). 2017. Australia. Participatory - oral communication. Conference.
- 8 Sara Arganda; Ignacio Arganda-Carreras; Darcy G. Gordon; Andrew P. Hoadley; Jessica F. Kamhi; James F. A. Traniello. Statistical brain atlases illuminate the evolution of worker neuroanatomy.. EURO IUSSI. University of Helsinki. 2016. Finland. Participatory - oral communication. Conference.
- 9 Sara Arganda; Sofia Bouchebti; Sepideh Bazazi; Gerard Latil; Steve Simpson; Jacques Gautrais; Audrey Dussutour. Amino acid role in high protein diet toxicity in ants. International Union for the Study of Social Insects 17th Congress. International Union for the Study of Social Insects. 2014. Australia. Participatory - oral communication. Conference.
- 10 Sara Arganda. Negative effects of amino acids on Argentine ant longevity. Colloque annuel de l'UIEIS Section Française. Université Paris XII /International Union for the Study of Social Insects (French section). 2013. France.

### C.3. Research projects and contracts

- 1 **Project.** Nutrición y respuesta a infecciones en sociedades de hormigas: Aproximación metabólica e histológica.. Universidad Rey Juan Carlos. Arganda. (Universidad Rey Juan Carlos). 01/01/2023-31/12/2023. 6.325,42 €.
- 2 **Project.** 2021-5A/BMD-20960, CONVOCATORIA AYUDAS ATRACCIÓN DE TALENTO INVESTIGADOR - 2017. MODALIDAD 1 - Financiación Adicional. Comunidad de Madrid. Sara Arganda Carreras. (Universidad Rey Juan Carlos). 06/04/2022-05/04/2023. 85.000 €. Desarrollo de línea de investigación propia en el estudio de la evolución del sistema nervioso en hormigas. Gestión de proyecto y supervisión de personal contratado.
- 3 **Project.** PGC2018-101012-A-I00, Integrating nutrition, immunology and neurobiology in ant societies. MINISTERIO DE ECONOMIA Y COMPETITIVIDAD. Jana Laia Montero Calle. (Universidad Rey Juan Carlos). 01/01/2019-31/12/2022. 121.000 €. Principal investigator. Co-PI a cargo de los experimentos de comportamiento y nutrición.
- 4 **Project.** 2017-T1/BMD- 5477, Convocatoria de ayudas para la atracción de talento investigador para su incorporación a grupos de investigación de la Comunidad de Madrid. Modalidad I (Jóvenes Investigadores). Convocatoria de 2017.. Comunidad de Madrid. Sara Arganda Carreras. (Universidad Rey Juan Carlos). 06/04/2018-05/04/2022. 308.150 €. Desarrollo de línea de investigación propia en el estudio de la evolución del sistema nervioso en hormigas. Gestión de proyecto y supervisión de personal contratado.
- 5 **Project.** ToNINA, Towards an integration of neurobiology, immunity and nutrition in ants. Projet International de Cooperation Scientifique (Now: International Emerging Actions). Audrey Dussutour. (Centre de Recherches sur la Cognition Animale / Universidad Rey Juan Carlos). 01/01/2019-31/12/2021. 18.000 €. Coordinadora del equipo español en la Universidad Rey Juan Carlos

### C.4. Activities of technology / knowledge transfer and results exploitation

Alfonso Pérez Escudero; Gonzalo García de Polavieja Embid; Sara Arganda Carreras. PCT/ES2013/070585. Método de transformación de imágenes en nubes de puntos multidimensionales, método de identificación de objetos e individuos, método de segmentación, método de localización de puntos de interés y usos Spain. 08/08/2012. CSIC.