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| CV date | 01/05/2023 |
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Part A. PERSONAL INFORMATION

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| First name | CAROLINA |
| Family name | MARUGÁN CRUZ |

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|---|----------------------|---------|
| e-mail | cmarugan@ing.uc3m.es | URL Web |
| Open Research and Contributor ID (ORCID)(*) | 0000-0002-1288-1963 | |

(*) Mandatory

A.1. Current position

| | | | |
|-------------------|---|----------------|----------------|
| Position | Associate Professor | | |
| Initial date | 2019 | | |
| Institution | Universidad Carlos III de Madrid (UC3M) | | |
| Department/Center | Ingeniería Térmica y de Fluidos/ Escuela Politécnica Superior | | |
| Country | Spain | Teleph. number | (+34)916249913 |
| Key words | | | |

A.2. Previous positions (research activity interruptions, art. 45.2.c)

| Period | Position/Institution/Country/Interruption cause |
|-----------------------|--|
| 20/02/2006-31/01/2010 | Ayudante/ UC3M/Spain |
| 05/09/2011-31/08/2013 | Profesor Ayudante Doctor/ UC3M |
| 25/10/2012-25/10/2013 | Profesor Ayudante Doctor/UC3M/Spain/Birth of a child |
| 01/09/2013-03/07/2016 | Profesor Visitante/UC3M/Spain |
| 29/08/2014-29/08/2015 | Profesor Visitante /UC3M/Spain/Birth of a child |
| 08/08/2016-08/08/2016 | Profesor Visitante/UC3M/Spain/Birth of a child |

A.3. Education

| PhD, Licensed, Graduate | University/Country | Year |
|---------------------------|--|------|
| PhD Matemática Industrial | Universidad Carlos III de Madrid / Spain | 2008 |
| Ingeniería Industrial | Universidad Carlos III de Madrid / Spain | 2004 |

Part B. CV SUMMARY (max. 5000 characters, including spaces)

Associate Professor in the University Carlos III of Madrid. She has published 27 papers in JCR journals, has an h-index=16 and her work has been cited more than 500 times. Carolina has participated in more than 20 international conferences. She is coauthor of 2 patents. She has led 3 publicly funded projects, coordinated a European Edulink project and more than 10 private projects with companies and other public entities. She has supervised 1 PhD student and is currently supervising another thesis student. Her work has granted her 2 six-years research period merits (sexenios).

Carolina has participated in more than 20 research projects (competitive calls), 3 as P.I. and more than 10 with I+D+I companies (8 as P.I.). She has been co-chair of the organizing committee of 2 international conferences.

Her expertise ranges from fundamental science where she worked on her early years to applied and industrial science. She has international collaborators from her research stays in Monash University (Australia), UCSD (USA), and Johns Hopkins University (USA) publications with them.

As part of her interests is the dissemination of research results: she has participated in outreach activities such as Science Week to communicate scientific advances to society at large. She has participated in the design of the Energy Engineering degree of University of UNAM Managua and the Master or Renewable Energy Systems of the Stellenbosch University (South Africa), University of Botswana and Polytechnic of Namibia. She has been part of the organizing committee of the ECRES2019 (VII European Conference on Renewable Energy Systems) and of the International Conference CNIT12 (Madrid, 2022).

She is an expert in concentrated solar energy for electricity production and industrial heat where she has been the principal investigator of one project financed with public grants and has worked with private companies and has more than 15 JCR papers in the field.

She has taught more than 1500 hours in Spanish and English, supervised more than 50 final degree or master projects. She has participated as a mentor in programs for assistance for students with disabilities and international students. She has been awarded the Carlos III University Remuneration Supplement for her teaching performance as well as recognition letter for her teaching merits.

She is currently vice rector for the Internationalization of the UC3M and she was the academic secretary of the Thermal and Fluids Engineering Department of the UC3M from 13/01/2014 to 17/09/2018.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications

1. R. Pérez-Álvarez, C. **Marugán-Cruz**, C. Sobrino, D. Santana. 2023. *Influence of the eccentricity on the thermomechanical performance of a bayonet tube of a central solar receiver*. Appl. Therm Eng. 223 119988.
2. J. Gómez-Hernández, R. Grimes, J.V. Briongos, C. Marugán-Cruz, D. Santana. 2023. *Carbon dioxide and acetone mixtures as refrigerants for industry heat pumps to supply temperature in the range 150-250°C*. Energy 269 126821.
3. M. Fernández-Torrijos, C. **Marugán-Cruz**, C. Sobrino, D. Santana. 2022. *The water cost effect of hybrid-parallel condensing systems in the economical performance of solar tower plants*. Appl Therm Eng. 202 117801.
4. I. Ramón-Álvarez, C. **Marugán-Cruz**, E. Enríquez, S. Sánchez-Delgado, M. Torres-Carrasco. 2021. *Alkali-activated and hybrid materials: Alternative to Portland Cement as storage media for solar thermal energy*. Bol Soc Esp Ceram Vidr.319, pp.1-14.
5. C. **Marugán-Cruz**, S. Sánchez-Delgado, J. Gómez-Hernández, D. Santana. 2020. *Towards zero water consumption in solar tower power plants*. Appl Therm Eng. 178/115505, pp.1-15.
6. M. Fernández-Torrijos, C. Sobrino; C. **Marugán-Cruz**, D. Santana. 2020. *Experimental and numerical study of the heat transfer process during the startup of molten salt tower receivers*. Appl Therm Eng. 178, pp.115528-1-15.
7. C. **Marugán-Cruz**, D. Serrano, J. Gómez Hernández, S. Sánchez-Delgado. 2019. *Solar multiple optimization of a DSG linear Fresnel power plant*. Energy Convers Manage. 184, pp.571-580.
8. M.R. Rodríguez Sánchez, C. **Marugán-Cruz**, A. Acosta-Iborra, D. Santana. 2018. *Thermo-mechanical modelling of solar central receivers: effect of incident solar flux resolution* Sol. Energy. 165, pp.43-54.
9. F.K. Petrakopoulou, S. Sánchez-Delgado, C. **Marugán-Cruz**, D. Santana. 2017. *Improving the efficiency of gas turbine systems with volumetric solar receivers*. Energy Convers Manage. 149, pp.579-592.
10. C. **Marugán-Cruz**, O. Flores, D. Santana, M. García-Villalba. 2016. *Heat transfer and thermal stresses in a circular tube with a non-uniform heat flux*. Int. J. Heat Mass Transfer. 96, pp.256-266.
11. C. **Marugán-Cruz**, S. Sánchez-Delgado, M. R. Rodríguez-Sánchez, D. Santana. 2015. *District cooling network connected to a solar power tower*. Appl. Therm. Eng. 79 pp.174-183.

12. M.R Rodríguez-Sánchez, **C. Marugán-Cruz**, A. Acosta-Iborra, D. Santana. 2014. *Comparison of simplified heat transfer models and CFD simulations for molten salt external receiver*. Appl Therm Eng. 73/1, pp.993-1005.

C.2. Congress

1. **C. Marugán-Cruz**; Sánchez-Delgado, S.; M. Venegas, M. Venegas. *Solar district heating and cooling in Spain*. XII CNIT (Engineering Thermodynamics International Conference) Madrid. Spain. July 2022.
M. Fernández-Torrijos, C. Sobrino, J.A. Almendros-Ibáñez, **C. Marugán-Cruz**; D. Santana *Experimental study of the preheating process of tubular external molten salt receivers*. XI National and II International Engineering Thermodynamics Congress. Oral communication. Albacete. Spain June 2019.
2. R. Pérez-Álvarez, **C. Marugán-Cruz**; D. Santana; A. Acosta-Iborra. *Comparison of the heat transfer characteristics of molten salt, liquid sodium and supercritical CO₂ in bayonet tubes of solar tower receivers*. 24th SolarPACES Conference. Oral communication. Casablanca. Morocco. October 2018.
3. M. Fernández-Torrijos, **C. Marugán-Cruz**; C. Sobrino; D. Santana. *Experimental Test of tubular external molten salt receivers under non-steady state conditions*. 24th SolarPACES Conference. Oral communication. Casablanca. Morocco. October 2018.
4. M. Fernández-Torrijos, **C. Marugán-Cruz**; C. Sobrino; D. Santana *Heat transfer experiments with a central receiver tube subjected to unsteady and non-uniform heat flux*. 22th SolarPACES Conference. Oral communication. Abu Dhabi. Arab Emirates. October 2016.
5. D. Serrano; Sánchez-Delgado, S.; C. Sobrino; **C. Marugán-Cruz**. *Dynamics and agglomeration of a fluidized bed reactor under Cynara Cardunculus L. Gasification with a new catalyst (Sepiolite)*. 4rd International Symposium on Gasification and its Applications (iSGA-4) Viena, Austria. September 2014.
6. **C. Marugán-Cruz**; Sanchez-Delgado, S.; M.R. Rodríguez Sánchez, M. Venegas. *District cooling using central tower power plant*. SolarPACES 2013 International Conference. Las Vegas. September 2013.
7. **C. Marugán-Cruz**; D. Santana, O. Flores, M. García-Villalba. *Thermal stresses analysis of a circular tube in a central receiver*. SolarPACES 2013 International Conference. Las Vegas. September 2013.

C.3. Research projects

1. Ecool-CM-UC3M, *Materiales elastocalóricos para refrigeración sólida*. CAM. Consejería de Educación e Investigación. P.I.: **C. Marugán-Cruz**, A. Vaz-Romero (UC3M). 01/01/2022-31/12/2024. 60.000 €
2. EIN2020-112442, *Hacia unas plantas solares de concentración competitivas, fiables, seguras y sostenibles*. Agencia Estatal de Investigación (AEI). P.I: C. Sobrino. (UC3M). 01/11/2020-31/10/2022. 14.200 €.
3. HORATSO-CM-UC3M, *Nuevos conceptos de hormigones sostenibles para almacenamiento de energía térmica solar* CAM. Consejería de Educación e Investigación. P.I: S. Sánchez-Delgado. (UC3M). 01/01/2020-31/03/2022. 55.843,98 €
4. RTI2018-096664-B-C21, *Operación segura de receptores tubulares mediante métodos de análisis inverso termo-elástico* Agencia Estatal de Investigación (AEI). P.I: A. Acosta Iborra. (UC3M). 01/01/2019-31/12/2021. 150.040 €.
5. *Almacenamiento energético del excedente eólico en partículas*. Fundación Iberdrola España. J. Gómez Hernández. (UC3M). 01/09/2019- 01/11/2020. 19.939 €.
6. ENE2015-69486-R, *Optimización de centrales termosolares, análisis transitorio y diseño de receptores bayoneta excéntricos*. Ministerio de Asuntos Económicos y Transformación Digital. P.I: A. Acosta Iborra. (UC3M). 01/01/2016-31/12/2018. 163.350 €.

7. *Mejora del sistema de admisión de aire en la góndola de un aerogenerador*. Fundación Iberdrola España. **C. Marugán-Cruz**. (UC3M). 01/09/2017-01/09/2018. 20.000 €.
8. *RENnet: Renewable Energies Education Network*. European Commission Research Executive Agency. P.I. J. Martínez Crespo. (UC3M). 08/10/2013-07/04/2017. 499.714 €.
9. *Participatory Integrated Assessment of Energy Systems to promote Energy Access and Efficiency (PARTICIPIA)* European Commission Research Executive Agency. Coordinator: **C. Marugán-Cruz**. (UC3M). 23/09/2013-22/09/2016. 500.000€.
10. ENE2012-34255, Estudio y Diseño de nuevos REceptores SOLares. Ministerio de Asuntos Económicos y Transformación Digital. P.I: **C. Marugán-Cruz**. (UC3M). 01/01/2013-30/06/2016. 79.560 €.

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

1. *Cálculo de eficiencias y viabilidad del sistema Pluvio* Arquimea Centro De Investigaciones Avanzadas SL. P.I: **C. Marugán-Cruz**, S. Sánchez-Delgado. 02/02/2021-02/03/2021. 4.000 €.
2. *Contrato de suministro de 4 lotes vinculados a sistemas de evaluación de calidad: Lote 3: Redcción del residuo orgánico urbano en vertedero y posterior valorización*. Limpieza y Medio Ambiente Getafe S.A. LYMA. P.I : **C. Marugán-Cruz**, S. Sánchez-Delgado. 21/09/2021-31/012/2022. 12.000 €.
3. *Simulación y análisis del comportamiento fluidotérmico del interior acondicionado de un refrigerador*. ARCELIK A.S.. P.I: **C. Marugán-Cruz**, A. Acosta Iborra (Universidad Carlos III de Madrid). 15/11/2020-. 21.300 €.
4. *Optimización energética y medioambiental de los sistemas de generación de frío de una industria cárnica* Productos Cárnicos Segundo Sanz, S.L P.I: .N. Garcia-Hernando. 01/03/2017-P6M. 1.000 €.
5. *Molten Salt Receiver Lab*. Sun To Market Solutions S.L. P.I. **C. Marugán-Cruz**. D. Santana. 01/01/2012-31/12/2014. 50.000 €
6. *Evaluación de Proyectos de I+D+i*. EQA Certificados IDI S.L. P.I: **C. Marugán-Cruz**. 18/10/2012-31/12/2012. 1250 €

Patents

1. D. Santana; M. R. Rodríguez-Sánchez, A. Acosta-Iborra; **C. Marugán-Cruz**. P201730456. *Receptor De Torre De Energía Solar España*. 03/10/2018. Universidad Carlos III de Madrid.
2. D. Santana; M. R. Rodríguez Sánchez, **C. Marugán-Cruz**; A. Soria-Verdugo, R. Wiesenberg J. E. Serrano Dorado; A. Ruano. PCT/ES2012/0703. *Receptor Termosolar España*. 30/07/2013. Universidad Carlos III De Madrid.

Evaluator / Reviewer

1. Evaluator of the European Commission Research Executive Agency
2. Evaluator of the Spanish Agency: Agencia Andaluza del Conocimiento.
3. Evaluator of the Spanish Agency: Madrid+id
4. Evaluator of teaching performance by the ANECA in Universidad Carlos III de Madrid.
5. Reviewer of scientific journals: Applied Thermal Engineering, Energy Conversion Management, Energy Storage, Journal of Fluid Mechanics, Physics of Fluids, Solar Energy
6. Member of the scientific committee of CNIT and ECRES.