MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

CV date	11/01/2022

First name	Domingo		
Family name	Santana Santana		

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Open Researcher and Contributor ID (ORCID) (*)		0000-0002-2171-1763

A.1. Current position

Position	Full professor-Catedrático (Department Head)		
Initial date	18/12/2017 (28/11/2021)		
Institution	Universidad Carlos III de Madrid		
Department/Center	Ingeniería Térmica y de Fluidos		
Country	Spain	Teleph. number	+34916248462
Key words	Concentrating solar energy, thermo-mechanical design		

A.2. Previous positions (research activity interuptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
1/1/1996-31/12/1999	M. de Educación y Ciencia, Subdirección de Personal Investigador (CICYT)/Universidad de Las Palmas de G.C. Spain
1/01/2000-30/11/2000	Fundación Universitaria de Las Palmas de G.C. Spain
1/12/2000-30/11/2003	Universidad Carlos III de Madrid. Spain
01/12/2003-26/11/2017	Universidad Carlos III de Madrid. Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor of Mathematics	Universidad de La Laguna	1994
PhD Che. Eng. (Energy and Environmental Eng.)	Universidad de Las Palmas de Gran Canaria	1999

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

I am coauthor of 83 JCR articles (62 Q1 43 in the best decile) published the most reputed journals in the fields of Energy and, previously, in Chemical engineering because until 2011 my main research field was fluidized bed gasification. In 2011 I was awarded a contract of Iberdrola for a solar receiver design and the checking of the oil-salt heat exchangers, and I began researching and new developments in the field of the receivers and heat exchangers of concentrating solar power plants. I have achieved H index 21 (1500 citations by 931 documents, last year 300 citations) made possible mainly through the results obtained for precise calculation of the steam generator and receiver temperature and stress distributions and the estimation of the damage and the lifetime for different operations. These papers had made possible that I had 4 positive evaluations of the research activities (4 sexenios). Some of such papers were collaborations with coauthors of international institutions as: DTU, Chalmers, Universidad Nacional Autónoma de México, Delft University, University of Science and Technology of China, University of Hull and University Tor Vergata. Also, with respect to

internationalization I was the head of the Shouhang (Chinese EPC company) research chair for the dissemination of concentrating solar technologies from 2015 to 2019.

On the other hand, respect to the leadership I am the head of the ISE research group (ise.uc3m.es) from 2012 to the present, a group formed by 24 researchers (4 full, 9 associate, 6 assistant, 2 postdoc, 2 Marie Curie and 2 predoc professors) also I was and now I am the head of the Department of Thermal and Fluid Engineering 5,5 years (2008-2013) and 2021-present and deputy head (2006-2008, 2015-2021).

I was PI in 11 research regional, national, and international projects and grants attracting a total funding of 800 m€

Regarding the collaboration with the private-sector companies I have one positive evaluation of technological transfer activities (sexenio de transferencia) I have been PI of 14 contracts (private funding) attracting a total funding of 650 m€ from national and international companies, as part of such activities I am Inventor of 6 patents, 4 of them licensed by two companies (Shouhang ans S2M). Also, I am expert evaluator for private I+D actions being 4D expert for AENOR and ACIE and 3D expert for Certifica I+D. These transfer activities were, mainly, in the field of thermomechanical designs or checking of heat exchangers for Iberdrola, S2M, Airbus, Shouhang, Gamesa, etc…

Regarding the training of researchers, I was supervisor of 13 theses (9 co-supervised) the first six thesis studying the gasification in fluidized beds and the last seven aimed at the analysis of different subsystems of the solar towers. My students are now: 1 senior researcher at Delft University, 1 assistant professor at UNIR, 1 associate professor at Universidad de Castilla La Mancha, 1 CEO of a technological company and 3 associate, 3 assistant and 3 post-doctoral professors at Universidad Carlos III de Madrid. Also, now I am mentor of 2 CONEX researchers (Marie Curie) and supervisor of one FPU student.

On the other hand, I am expert evaluator of I+D proposals for the La Agencia de Certificación en Innovación Española (ACIE), Swiss National Science Foundation, la DEVA de la Junta de andalucía, INCITE de la Xunta de Galicia, la AEI (previously ANEP), expert evaluator of fellowships for the DEVA, AEI and Junta de Comunidades de Castilla La Mancha and president of the energy and transport research fields for the Agencia Andaluza del Conocimiento (2018-present)

Part C. RELEVANT MERITS

C.1. Publications

Cano-Pleite, E., Fernández-Torrijos, M., Santana, D., Acosta-Iborra, A., Heat generation depth and temperature distribution in solar receiver tubes subjected to induction, (2022) Applied Thermal Engineering, 204, art. no. 117902, .

Laporte-Azcué, M., González-Gómez, P.A., Rodríguez-Sánchez, M.R., Santana, D., A procedure to predict solar receiver damage during transient conditions, (2022) Renewable and Sustainable Energy Reviews, 154, art. no. 111905, .

Laporte-Azcué, M., González-Gómez, P.A., Rodríguez-Sánchez, M.R., Santana, D., A procedure to predict solar receiver damage during transient conditions, (2022) Renewable and Sustainable Energy Reviews, 154, art. no. 111905, .

Laporte-Azcué, M., Rodríguez-Sánchez, M.R., González-Gómez, P.A., Santana, D., Assessment of the time resolution used to estimate the central solar receiver lifetime, (2021) Applied Energy, 301, art. no. 117451, .

González-Gómez, P.A., Rodríguez-Sánchez, M.R., Laporte-Azcué, M., Santana, D., Calculating molten-salt central-receiver lifetime under creep-fatigue damage, (2021) Solar Energy, 213, pp. 180-197.

Fernández-Torrijos, M., Sobrino, C., Marugán-Cruz, C., Santana, D., Experimental and numerical study of the heat transfer process during the startup of molten salt tower receivers, (2020) Applied Thermal Engineering, 178, art. no. 115528, .

Montoya, A., Rodríguez-Sánchez, M.R., López-Puente, J., Santana, D., Influence of longitudinal clips in thermal stresses and deflection in solar tubular receivers, (2020) Solar Energy, 198, pp. 224-238.

Laporte-Azcué, M., González-Gómez, P.A., Rodríguez-Sánchez, M.R., Santana, D., Deflection and stresses in solar central receivers, (2020) Solar Energy, 195, pp. 355-368.

González-Gómez, P.A., Gómez-Hernández, J., Briongos, J.V., Santana, D., Lifetime analysis of the steam generator of a solar tower plant, (2019) Applied Thermal Engineering, 159, art. no. 113805, .

Fernández-Torrijos, M., Sobrino, C., Almendros-Ibáñez, J.A., Marugán-Cruz, C., Santana, D., Inverse heat problem of determining unknown surface heat flux in a molten salt loop, (2019) International Journal of Heat and Mass Transfer, 139, pp. 503-516.

González-Gómez, P.A., Gómez-Hernández, J., Ferruzza, D., Haglind, F., Santana, D., Dynamic performance and stress analysis of the steam generator of parabolic trough solar power plants, (2019) Applied Thermal Engineering, 147, pp. 804-818.

C.2. Congress

SolarPACES 2020, Online, Septiembre, 2020., Pérez-Álvarez, R., Acosta-Iborra, A., Santana, D., Multiresolution analysis of the thermal stresses in an absorber bayonet tube for SPT receivers

SolarPACES 2019, Daegu (South Korea), Octubre 1-4, 2019., Pérez-Álvarez, R., Acosta-Iborra, A., Santana, D Multiresolution analysis of the thermal stresses in an absorber bayonet tube for SPT receivers.

SolarPACES 2018, Casablanca (Marruecos), Octubre 2-5, 2018., Laporte-Azcué, M., Rodríguez-Sánchez, M.R., Santana, D. Elliptical tubes receivers' efficiency analysis in solar power towers.

Montoya, A., Rodríguez-Sánchez, M.R., López-Puente, J., Santana, D. Thermal stress variation in a solar central receiver during daily operation.

Pérez-Álvarez, R.; Laporte-Azcué, M.; Acosta-Iborra, A.; Santana, D.Effect of eccentricity on the thermal stresses in a bayonet tube for solar power tower receivers. ORAL

XVI Congreso Ibérico y XII Congreso Iberoamericano de Energía Solar (CIES 2018), June 20-22, Madrid, España. Montoya, A., Rodríguez-Sánchez, M.R., López-Puente, J., Santana, D. Influencia de los soportes longitudinales en los tubos de los receptores solares térmicos.

Pérez-Álvarez, R.; Acosta-Iborra, A.; Santana, D. Comparación del comportamiento térmico del flujo de sales y sodio fundido en tubos bayoneta de receptores solares de torre central. ORAL.

SASEC 2018 (5th Southern African Solar Energy Conference). Durban, South Africa, 2018. Sánchez-González, A.; Rodríguez-Sánchez, M.R.; Santana, D. Aiming strategy for molten salt receivers.

SolarPACES 2017, Santiago de Chile, Chile, 2017. Rodríguez-Sánchez, M.R., Acosta-Iborra, A., Marugán-Cruz, C., Santana, D. Eccentric bayonet receiver for solar power tower.

C.3. IP in Research projects

Operación segura de receptores tubulares mediante métodos de análisis inverso termo-elástico (SOSreceiver), Ministerio de Ciencia, Innovación y Universidades (RTI2018-096664-B-C21) 1/1/2019-31/12/2021

EUROFUSION BOP-2.2 Preliminary thermo-mechanical analysis of steam generators and heat exchangers European Commission Research Executive Agency (EUROFUSION) 1/1/2019-31/12/2020

Energía solar térmica de concentración en el sector del transporte y en la producción de calor y de electricidad (ACES2030-CM) Consejería de Educación e Investigación de la Comunidad de Madrid (P2018/EMT-4319) 1/1/2019-31/12/2022

Optimización de centrales termosolares, análisis transitorio y diseño de receptores bayoneta excéntricos (Extrasol) Ministerio de Economía y Competitividad (ENE2015-69486-R) 1/1/2016-31/12/2018

Molten salt receiver lab (mosarela) cdti (idi-20120128-1/1/2012- 31/12/2014

Aprovechamiento energético de la biomasa del cardo y valorización de subproductos (cardener-cm) comunidad de madrid (s2009/ene-1660) 1/1/2010-1/05/2014

Almacenamiento de energía solar térmica en un lecho fluidizado con materiales de cambio de fase Junta Castilla La Mancha (ppic10-0055-4054) 1/1/2010-31/12/2013

Tecnologías para la gestión automatizada e inteligente de las redes de distribución energética del futuro (PROYECTO ENERGOS). Actividad Turbinas de gas CDTI. Ministerio de Industria. Diagnostiqa CENIT 09 1/12/2009-31/12/2012

C.4. IP in Contracts, technological or transfer merits

Diseño termo-mecánico de un evaporador para hidrógeno líquido, Airbus Operations SL. 01/09/2021- 31/12/2021

Shouhang research chair, Beijing Shouhang ihw resources saving technology co., ltd, 03/06/2015- 30/09/2019

Estudio wtg en alta temperatura nacelle. estudio de soluciones para optimización de wtg en alta temperatura, Gamesa innovation and technology slu 01/09/2016-31/12/2016

Design and performance tool for a solar power plant of 10MWe, Beijing Shouhang ihw resources saving technology co., ltd 03/06/2015- 02/06/2016

Diseño de cámara plenum y distribuidor de un lecho fluido, hornos y metales (hormesa) 20/4/2016- 8/5/2016

Patent D. Santana, J. Gómez-Hernandez, J. Villa and P.A. González-Gómez, Solar linear beam-down optical system (ES2648148/WO2018162779) licensed agreement with Beijing Shouhang ihw Resources Saving Technology co., ltd

Patent: D. Santana, M.R. Rodríguez, C. Marugán and A. Acosta, Receiver for solar power tower (ES2648737), licensed agreement with Beijing Shouhang ihw Resources Saving Technology co., ltd

Patent: D. Santana, M.R. Rodríguez, M. Laporte, J. Lopez-Puente and A. Acosta, receptor solar de torre exterior, P201830587