







## Part A. PERSONAL INFORMATION

		<b>CV date</b>	April 2022
First and Family name	Manuel M. Ruiz de Adana Santiago		
Passport, ID number		Age	
Researcher ID codes	Researcher ID	K-9185-2014	
	Orcid code	0000-0002-7890-7505	

 <b>Linked in</b>	<a href="https://es.linkedin.com/in/manuelruizdeadana">https://es.linkedin.com/in/manuelruizdeadana</a>
 <b>Publons</b> h-index 15	<a href="https://publons.com/researcher/1751416/manuel-ruiz-de-adana/">https://publons.com/researcher/1751416/manuel-ruiz-de-adana/</a>
 <b>ORCID</b>	<a href="http://orcid.org/0000-0002-7890-7505">http://orcid.org/0000-0002-7890-7505</a>
 <b>ResearchGate</b> h-index 17	<a href="https://www.researchgate.net/profile/Manuel_Ruiz_de_Adana">https://www.researchgate.net/profile/Manuel_Ruiz_de_Adana</a>
 <b>Google Scholar</b>	<a href="https://scholar.google.com/citations?user=c5RkRVcAAAAJ">https://scholar.google.com/citations?user=c5RkRVcAAAAJ</a>
 <b>Scopus</b> h-index 16	<a href="https://www.scopus.com/authid/detail.uri?authorId=57194642368">https://www.scopus.com/authid/detail.uri?authorId=57194642368</a>

### A.1. Current position

Name of University	University of Cordoba		
Department	Physical Chemistry and Applied Thermodynamics		
Address and Country	Building Da Vinci – Campus of Rabanales Ctra Madrid-Cadiz km 396 14071 Córdoba (Spain)		
Phone number		E-mail	
Current position	Full Professor	From	2021
Espec. cód. UNESCO	2204; 330590: 3311		
Palabras clave	Innovative HVAC systems; Renewable cooling systems; Indoor Air		

### A.2. Education

PhD	University	Year
Doctorate in Industrial Engineering	University of La Rioja	2002

### A.3. JCR articles, h Index, thesis supervised...

- 3 period of 6 years research production recognized by the national committee for the assessment of the research action (CNEAI). Last period of research recognized: 2013-2018. Regulation 5/6/2019 by the national committee for the assessment of the research action (CNEAI).
- 1 period of 6 year of knowledge transfer between universities and industrial companies recognized by the national committee (CNEAI). Last period of research recognized: 2006-2012. Regulation 14/11/2018 by the national committee (CNEAI).
- 7 Doctoral Thesis supervised. 3 ongoing Doctoral Thesis.
- 34 JCR research papers: (25Q1; 7Q2; 2Q3).
- h-index: 15 (<https://publons.com/researcher/1751416/manuel-ruiz-de-adana/metrics/> last accessed 25/4/2022 10:00 GMT).

## Part B. CV SUMMARY

Full Professor, Department of Applied Thermodynamics, Polytechnic School of Industrial Engineering at University of Cordoba (Spain), member of Ashrae, Atecyr and Rehva.

His present research is related to Innovative HVAC systems and Indoor Air topics. Renewable HVAC systems, Ventilate Facades and Green Roofs in buildings, Indoor Air and airborne cross infection risk between persons.

Experience in laboratory and field experiments and thermal and fluid mechanics measurement techniques. Professor at undergraduate, graduate, Master and Ph.D. courses. Supervisor of Ph.D. and M.Sc. students. Has got leadership and management experience by leading international and national research projects, and by organizing national conferences and postgraduate courses. Published in peer reviewed journals.

## Part C. RELEVANT MERITS

### C.1. Recent publications (including books)

1. **JCR article (Q2).** Romero-Lara, M.J.; Comino, F.; **Ruiz de Adana, M. 2021.** Seasonal Analysis Comparison of Three Air-Cooling Systems in Terms of Thermal Comfort, Air Quality and Energy Consumption for School Buildings in Mediterranean Climates. *Energies*, 14, 4436 (2021).  
<https://doi.org/10.3390/en14154436>
2. **JCR article (Q1).** F. Comino, F. Taboas, F. Peci, M. **Ruiz de Adana. 2020.** Detailed experimental analysis of the energy performance of a desiccant wheel activated at low temperature, *Applied Thermal Engineering* 178 115580 (2020).  
<https://doi.org/10.1016/j.solener.2020.02.103>
3. **JCR article (Q1).** F. Peci, F. Taboas, F. Comino, **M. Ruiz de Adana. 2020.** Experimental study of a modular Unglazed transpired collector Façade for building refurbishment, *Solar Energy* 201 247-258 (2020).  
<https://doi.org/10.1016/j.solener.2020.02.103>
4. **JCR article (Q1).** F. Comino, J. Castillo González, F.J. Navas-Martos, **M. Ruiz de Adana. 2020.** Experimental energy performance assessment of a solar desiccant cooling system in Southern Europe climates, *Applied Thermal Engineering* 165 (2020) 114579.  
<https://doi.org/10.1016/j.applthermaleng.2019.114579>
5. **JCR article (Q1).** F.A. Berlanga, L. Liu, P.V. Nielsen, R.L. Jensen, Alexandre Costa, I. Olmedo, **M. Ruiz de Adana. 2020.** Influence of the geometry of the airways on the characterization of exhalation flows. Comparison between two different airway complexity levels performing two different breathing functions, *Sustainable Cities and Society* 53 (2020) 101874.  
<https://doi.org/10.1016/j.scs.2019.101874>
- JCR article (Q2).** Jorge M. Llamas, David Bullejos, **Manuel Ruiz de Adana. 2019.** Optimization of 100 MWe Parabolic-Trough Solar-Thermal Power Plants Under Regulated and Deregulated Electricity Market Conditions, *Energies* 2019, 12, 3973.  
<https://doi.org/10.3390/en12203973>
6. **JCR article (Q1).** Francisco J. Rodriguez-Lozano, Fernando León-García, **M. Ruiz de Adana**, Jose M. Palomares, J. Olivares. **2019.** Non-Invasive Forehead Segmentation in Thermographic Imaging, *Sensors* 2019, 19, 4096.  
<https://doi.org/10.3390/s19194096>
7. **JCR article (Q1).** F. Peci-López, F. Táboas, F. Comino, **M. Ruiz de Adana. 2019.** Experimental study of overheating of an unglazed transpired collector façade under southern European summer conditions for four modes of operation, *Solar Energy*. 189 (2019) 194-206.  
<https://doi.org/10.1016/j.solener.2019.07.058>
8. **JCR article (Q1).** Olmedo, I.; Berlanga-Cañete, F. A.; Villafruela, J. M.; **Ruiz de Adana, M. 2019.** Experimental variation of the personal exposure in a hospital room influenced by wall heat gains. *Energy and Buildings*. 2019: 154: 252-262.  
<https://doi.org/10.1016/j.buildenv.2019.03.008>
9. **JCR article (Q1).** Villafruela JM, Olmedo I, Berlanga FA, **Ruiz de Adana M. 2019.** Assessment of displacement ventilation systems in airborne infection risk in hospital rooms. *PLoS ONE* 14(1): e0211390.  
<https://doi.org/10.1371/journal.pone.0211390>.
10. **JCR article (Q1).** F. Comino, D. Guijo-Rubio, **M. Ruiz de Adana**, C. Hervás-Martínez. **2019.** Validation of multitask artificial neural networks to model desiccant wheels activated at low temperature. *International Journal of Refrigeration*, 100, 434–442.  
<https://doi.org/10.1016/j.ijrefrig.2019.02.002>
11. **JCR article (Q2).** Jorge M. Llamas, David Bullejos, **Manuel Ruiz de Adana. 2019.** Optimal Operation Strategies into Deregulated Markets for 50 MWe Parabolic Trough Solar Thermal Power Plants with Thermal Storage. *Energies* 2019, 12, 935.  
<https://doi.org/10.3390/en12050935>
12. **JCR article (Q1).** Francisco Comino, Samanta Milani, Stefano De Antonellis, Cesare Maria Joppolo, **Manuel Ruiz de Adana. 2018.** Simplified performance correlation of an indirect evaporative cooling system: Development and validation. *International Journal of*

Refrigeration, 88, 307-317.

<https://doi.org/10.1016/j.ijrefrig.2018.02.002>

13. **JCR article (Q1)**. Berlanga-Cañete, Félix Antonio; **Ruiz De Adana-Santiago, Manuel**. Olmedo, Inés; Villafruela, Jose Manuel; San Jose, Julio; Castro, Francisco. **2018**. Experimental assessment of different mixing air ventilation systems on ventilation performance and exposure to exhaled contaminants in hospital rooms. *Energy and Buildings*. 2018: 177: 207-219.  
<https://doi.org/10.1016/j.enbuild.2018.07.053>
14. **JCR article (Q1)**. Berlanga FA, **Ruiz de Adana M.**, Olmedo I, Villafruela JM., San José JF, Castro F. **2018**. Experimental evaluation of thermal comfort, ventilation performance indices and exposure to airborne contaminant in an airborne infection isolation room equipped with a displacement air distribution system, *Energy and Buildings*. 2018 158: 209–221. <https://doi.org/10.1016/j.enbuild.2017.09.100>
15. **JCR article (Q1)**. F. Peci, F. Comino, M. **Ruiz de Adana**. **2018**. Performance of an unglazed transpire collector in the facade of a building for heating and cooling in combination with a desiccant evaporative cooler. *Renewable Energy* 122 (2018) 460-471.  
<https://doi.org/10.1016/j.renene.2018.01.029>
16. **JCR article (Q1)**. F. Comino, **M. Ruiz de Adana**, F. Peci. **2018**. Energy saving potential of a hybrid HVAC system with a desiccant wheel activated at low temperatures and an indirect evaporative cooler in handling air in buildings with high latent loads, *Applied Thermal Engineering*, 131: 412-427.  
<https://doi.org/10.1016/j.applthermaleng.2017.12.004>
17. **JCR article (Q1)**. Berlanga-Cañete, Félix Antonio; Olmedo-Cortés, Inés; **Ruiz De Adana-Santiago, Manuel**. **2016**. Experimental analysis of the air velocity and contaminant dispersion of human exhalation flows. *Indoor Air*. 2016: 1-13.  
<http://dx.doi.org/10.1111/ina.12357>
18. **JCR article (Q1)**. Comino-Montilla; Peci, F.; **M. Ruiz de Adana**. **2016**. First and second order simplified models for the performance evaluation of low temperature activated desiccant wheels. *Energy and Buildings*. 116: 574-582.  
<http://dx.doi.org/10.1016/j.enbuild.2016.02.005>
19. **JCR article (Q1)**. F. Comino, **M. Ruiz de Adana**. **2016**. Experimental and numerical analysis of desiccant wheels activated at low temperatures. *Energy and Buildings*. 133: 529–540.  
<http://dx.doi.org/10.1016/j.enbuild.2016.10.021>
20. **Book chapter**. **Ruiz de Adana Santiago, Manuel**. *Fundamentals of Natural Ventilation in Buildings*. Efficient Architecture Volume I. Editor University of Basque Country. 2012. I.S.B.N. 978-84-9860-688-1.

#### C.4. Recent international conferences

1. **International conference**. F. Comino, M.J. Romero, **M. Ruiz de Adana**. (2021). Experimental and numerical analysis of regenerative indirect evaporative coolers. *Innovations Sustainability Modernity Openness 2021*, May 13, 2021, Bialystok (Poland).
2. **International conference**. M.J. Romero, F. Comino, **M. Ruiz de Adana**. (2021). Seasonal performance analysis of three air-cooling systems for school buildings. *Innovations Sustainability Modernity Openness 2021*, May 13, 2021, Bialystok (Poland).
3. **International conference**. F. Comino, F. Peci, **M. Ruiz de Adana**. (2019). Very low energy consumption HVAC systems for NZEB buildings. The potential of indirect evaporative coolers in South European climates. *International Conference on Green Construction ICGC 2019*, April 8-9, 2019, Córdoba (Spain).
4. **International conference**. F. Peci, F. Comino, **M. Ruiz de Adana**, F. Taboas. (2019). Testing overheating in an unglazed transpired collector in the summer season. *International Conference on Green Construction ICGC 2019*, April 8-9, 2019, Córdoba (Spain).
5. **International conference**. M. Porcaro, **M. Ruiz de Adana**, F. Comino, A. Peña, E. Martín-Consuegra, T. Vanwalleghem. (2019). Energy saving potential of green roofs in South European climates. *International Conference on Green Construction ICGC 2019*, April 8-9, 2019, Córdoba (Spain).

## C.2. Research projects and grants

### C.2.1. Research Projects (ongoing Research Projects as Principal Investigator)

1. **Research Project.** WEDISTRIC. Smart and local renewable Energy DISTRICT heating and cooling solutions for sustainable living. H2020-WIDESPREAD2018-03-857801. H2020-LC-SC3-2018-2019-2020 (BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE: SECURE, CLEAN AND EFFICIENT ENERGY) Topic: LC-SC3-RES-8-2019 Type of action: IA Proposal. **PI Ruiz de Adana, Manuel. 2019-2021.** 458,781.25 €.
2. **Research Project.** BIORISK. Bioaerosols in Hospital Environments. Risk assessment. RTI2018-094703-B-100. Ministry of Economy and Competitiveness, Ministry of Research, Development and Innovation (Spain). Retos 2018. **PI Ruiz de Adana, Manuel. 2019-2021.** 119,790 €.

### C.3. Contracts (as Principal Investigator)

1. **Contract UTAP-CDTI.** Research and development of air treatment and purification equipment. Ref. 12020184, KEYTER TECH. (Spain). **PI Ruiz de Adana, Manuel. 2021-2022.** 92.244,70 €.
2. **Contract R-UTAP-CDTI.** R-UTAP: Research and development of air purification treatment equipment in refrigeration equipment. Ref. 12021004, KEYTER TECH. (Spain). **PI Ruiz de Adana, Manuel. 2021-2022.** 26,520 €.
3. **Contract CLIMASEE.** New environmentally sustainable air conditioning system based on evaporative cooling technology. Ref. 12020113, Fundación Andaltec I+D+i. Andalucía. **PI Ruiz de Adana, Manuel. 2020-2021.** 4,392 €.
4. **Contract ESATEX-CDTI.** Sensory study in ATEX environment. Ref. 12018053, BODEGAS FUNDADOR S.L.U. Andalucía. **PI Ruiz de Adana, Manuel. 2018-2019.** 18,650 €.
5. **Contract SOLPLAS:** Research of secondary equipment coupled to the solar concentrator. Ref. 12017251, Fundación Andaltec I+D+i. Andalucía. **PI Ruiz de Adana, Manuel. 2018-2018.** 4,000€.
6. **Contract PVCOMFORT-CDTI.** Development of prototypes for direct coupling of photovoltaic solar energy in efficient equipment for air conditioning and DHW production in the tertiary and domestic sector. CDTI. Ref. OTRI-OTEM 12018096, KEYTER TECH. (Spain). **PI Ruiz de Adana, Manuel. 2018-2020.** 74.700 €.
7. **Contract NATURCOOL-CTA.** Research and technological development in dual circuit reversible air conditioning with alternative refrigerant. Ref. OTRI-OTEM 12013106, Technological Corporation of Andalusia and CIAT-CIATESA (Spain). **PI Ruiz de Adana, Manuel. 2013-2016.** 69,374 €.
8. **Contract DESSECA-CTA.** Research and technological development in new systems for air dehumidification and drying process integrated in new HVAC systems. Ref. OTRI-OTEM 12012163, Technological Corporation of Andalusia and CIAT-CIATESA (Spain). **PI Ruiz de Adana, Manuel. 2012-2016.** 81,535 €.

### C.5, C.6, C.7. (Memberships of scientific societies, Awards)

**Membership.** International Scientific Committee Member. Roomvent Ventilation 2020.

<http://roomvent2020.org/committee/>

**Membership.** Associate Editor International Journal of Contemporary Energy ISSN: 2363-644

<http://contemporary-energy.net/Editorial-Board/editorial-board.html>.

**Award.** Sustainable Development Award, promoted by Diario CÓRDOBA (Spain) (1st edition) for the Project: "WEDISTRIC. Smart and local renewable Energy DISTRICT heating and cooling solutions for sustainable living". December **2020**. University of Cordoba.

**Award.** Knowledge Transfer to Industrial Companies (4th edition) for the Project: "Development of control strategies for HVAC systems". December **2013**. University of Cordoba.

**Award.** Business Ideas Competition (6th edition) for the project: "Solar Cooling". Advisory Committee on Transfer and Innovation at the University of Cordoba. November **2012**. University of Cordoba.