

<b>Part A. PERSONAL INFORMATION</b>		<b>CV date</b>		06/06/2022
First and Family name	Gonzalo Barluenga Badiola			
ID number	09417579 E	Age	48	
Researcher codes	WoS Researcher ID (*)	E-7781-2016		
	SCOPUS Author ID(*)	6506335798		
	Open Researcher and Contributor ID (ORCID) **	0000-0002-2996-3412		

### A.1. Current position

Name of University/Institution	Universidad de Alcalá		
Department	Arquitectura/Escuela de Arquitectura		
Address and Country	Calle Santa Ursula, 8. Alcalá de Henares. 28801-Madrid		
Phone number	658430646	E-mail	<a href="mailto:Gonzalo.barluenga@uah.es">Gonzalo.barluenga@uah.es</a>
Current position	Full Professor	From	05/10/2021
Key words	Architecture; Building Technology; Advanced Building Materials; Advanced Concrete; Sustainable Construction; Nanomaterials		

### A.2. Education

Degree	University	Year
Architect	Polytechnic University of Madrid	1998
PhD in Architecture	Polytechnic University of Madrid	2002

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

**CNEAI Recognized Research periods:** 3 (1999-2004, 2005-2010, 2011-2016). **PhD thesis supervised:** 5 **Journal Papers in Q1 (WoS):** 31/45. **Cites (SCI-e):** 1114. **5 years citing average:** 123,4. **H-Index:** 15. **Coauthors:** 43 (18 international)

### Part B. CV SUMMARY (max. 3500 characters, including spaces)

I obtained the PhD in Architecture at the Polytechnic University of Madrid in 2002. For two years I was interim Professor at the School of Building Technology of the same University and become Associate Professor (tenure track) at the University of Alcalá in 2004. I got the National Habilitation as Professor in 2007 and got the Professor permanent position in 2008, involving duties related to graduate and postgraduate teaching, research, and administrative management. I was elected Head of the Department of Architecture of the UAH from 2008 till 2011. During this period I promoted the first PhD Program in Architecture of the University, becoming the first Director of the PhD Program. Afterwards I become Coordinator of the PhD Program from 2016-2020. I got Full Professorship position in 2021.

My lines of research focus on the design and characterization of innovative, energy efficient and sustainable building materials, systems and technologies for Architectural applications and refurbishment. I have been Principal Investigator of 7 national and regional research programs, principal investigator of UAH group in one coordinated international project (EU HORIZON-MSCA-2021-SE) and researcher in one NSF (USA) project during a one-year postdoctoral research stay, all of them funded in competitive calls. The results of my research activity include 45 articles indexed in ISI-WoS (1114 SCI-e cites) and 48 indexed in SCOPUS (1335 cites), 42 book chapters (conference proceedings with peer-review), 17 technical reports. I have presented one plenary lecture, 54 oral presentations in international conferences and 7 in national conferences. I have three national patents with preliminary exam and one with international-PCT extension.

The research group that I lead since 2009 in the UAH has worked in new building technologies and the design and characterization of conglomerated based building materials in architecture for energy efficiency and refurbishment, rendering mortars, self-compacting concrete, early age and climate monitoring, physical-mechanical characterization and material microstructure analysis. I have led the collaboration of my research group with national groups (UPM,



CSIC, UCM, AITEMIN, ULPGC, UPV) and international groups (Virginia Tech - USA, University of Bath, Queen's University at Belfast - UK, University of Darmstadt – Germany, Southern Brittany University – France, University of Ourgala - Tunisia) producing 23 collaborative indexed publications (SCOPUS). The group has hosted 4 postdoctoral fellows: one from India (EU MSCA, 2020-2022), one from Mexico (Banco Santander, 6 months in 2016) and two from Spain (UAH Postdoctoral contract, one year each, 2016 and 2018) and one pre-doctorate fellow from Tunisia (Pre-doctorate grant six months in 2016-2017).

## Part C. RELEVANT MERITS

### C.1. Indexed Publications (journal papers and book chapters) (Last 5 years)

- Guardia, C; Barluenga, G; Palomar, I, 2022, Evaluation of the energy storage capacity of Phase Change Material cement-lime mortars by using heat flux meters and ultrasonic pulse transmission. *Journal of Energy Storage* 50: 104674.
- Varela, H; Barluenga, G; Palomar, I; Sepulcre, A, 2021, Synergies on rheology and structural build-up of fresh cement pastes with nanoclays, *Construction and Building Materials* 308: 125097.
- Vedralnam, A., Kumar, S., Barluenga, G., Chaturvedi, S., 2021, Early crack detection using modified spectral clustering method assisted with FE analysis for distress anticipation in cement-based composites, *Scientific Reports*, 2021, 11(1), 19685
- Palomar, I, Barluenga, G, Varela, H, Puentes, M, Rodriguez, A, 2020, Non-Destructive Evaluation of Micro-Cracked SCC by Ultrasonic Waves. In: *Current Topics and Trends on Durability of Building Materials and Components*, 1047-1054, International Center for Numerical Methods in Engineering (CIMNE).
- Varela, H, Barluenga, G, Palomar, I, 2020, Rheology evaluation of cement paste with nanoclays, nanosilica and polymeric admixtures for digital fabrication. In: *Second RILEM International Conference on Concrete and Digital Fabrication, Digital Concrete 2020, RILEM Bookseries*, 28: 144-152, Springer.
- Guardia, C; Barluenga, G; Palomar, I, 2020, PCM Cement-Lime Mortars for Enhanced Energy Efficiency of Multilayered Building Enclosures under Different Climatic Conditions. *Materials* 13 (18): 4043.
- Varela, H, Barluenga, G, Palomar, I, Sepulcre, A, 2020, Effects of Nanoclays on SCC Paste Rheology. In: *Rheology and Processing of Construction Materials, RILEM Bookseries*, 23:517-524, Springer.
- Barluenga, G, Palomar, I, Guardia, C, Varela, H, Hernandez-Olivares, F, 2020, Rheology and Build-Up of Fresh SCC Pastes Evaluated with the Mini-slump Cone Test. In: *Rheology and Processing of Construction Materials. RILEM Bookseries*, 23:160-167, Springer.
- Varela, H; Barluenga, G; Palomar, I, 2020, Influence of nanoclays on flowability and rheology of SCC pastes, *Construction and Building Materials* 243: 118285. Guardia, C., Schicchi, D.S., Caggiano, A., Barluenga, G., Koenders, E. On the capillary water absorption of cement-lime mortars containing phase change materials: Experiments and simulations. *Building Simulation* 13 (1) (2020) 19-31.
- Varela, H., Barluenga, G., Palomar, I., Sepulcre, A. Effects of Nanoclays on SCC Paste Rheology. In: *Rheology and Processing of Construction Materials. RILEM Bookseries*, Springer. Vol. 23 (2020) 517-524.
- Palomar, I., Barluenga, G., Guardia, C., Alonso, M.C., Álvarez, M. Rheological Characterization of Self-compacting Concrete Pastes with Polymeric Admixtures. . In: *Rheology and Processing of Construction Materials. RILEM Bookseries*, Springer. Vol. 23 (2020) 491-499.
- Barluenga, G., Palomar, I., Guardia, C., Varela, H., Hernandez-Olivares, F. Rheology and Build-Up of Fresh SCC Pastes Evaluated with the Mini-slump Cone Test. In: *Rheology and Processing of Construction Materials. RILEM Bookseries*, Springer. Vol. 23 (2020) 160-167.
- Vedralnam, A., Bedon, C., Barluenga, G., 2020, Study on the compressive behaviour of sustainable cement-based composites under one-hour of direct flame exposure, *Sustainability (Switzerland)*, 2020, 12(24), pp. 1–24, 548



- I. Palomar, G. Barluenga, R.J. Ball, M. Lawrence. Laboratory characterization of brick walls rendered with a pervious lime-cement mortar. *Journal of Building Engineering* 23 (2019) 241-249.
- Guardia, C., Barluenga, G., Palomar, I., Diarce, G. Thermal enhanced cement-lime mortars with phase change materials (PCM), lightweight aggregate and cellulose fibers. *Construction and Building Materials* 221 (2019) 586-594
- Barluenga, G.; Puentes, J.; Palomar, I.; Guardia, C.. Methodology for monitoring Cement Based Materials at Early Age combining NDT techniques. *Construction and Building Materials* 193 (2018) 373-383
- Barluenga, G; Gimenez, M; Sepulcre, A.; Palomar, I. Effect of full scale pumping at early age and on hardened microstructure and properties of SCC with fly ash in hot-dry curing conditions. *Construction and Building Materials* 191 (2018) 1128-1138
- Barluenga, G; Guardia, C.; Puentes, J. Effect of curing temperature and relative humidity on early age and hardened properties of SCC. *Construction and Building Materials* 167 (2018) 235-242.
- Palomar, I.; Barluenga, G. A multiscale model for pervious lime-cement mortar with perlite and cellulose fibers. *Construction and Building Materials* 160 (2018) 136-144.
- G. Barluenga, M. Giménez, A. Rodríguez, O. Rio. Quality Control Parameters for on-site evaluation of pumped Self-Compacting Concrete. *Construction and Building Materials* 154 (2017) 1112-1120.
- T. Tioua, A. Kriker, G. Barluenga, I. Palomar. Influence of date palm fiber and shrinkage reducing admixture on self-compacting concrete performance at early age in hot-dry environment. *Construction and Building Materials* 154 (2017) 721-733.
- Tioua T, Kriker A, Bali A, Barluenga A, Behim M. Properties of Self-Compacting Concrete with Natural and Synthetic Fibers. 10th ACI/RILEM International Conference on Cementitious Materials and Alternative Binders for Sustainable Concrete. AMERICAN CONCRETE INSTITUTE (2017). Vol. ACI SP-320. p. 303-311. ISBN-13: 978-1-945487-77-4; ISSN: 0193-2527
- I. Palomar, G. Barluenga. Assessment of lime-cement mortar microstructure and properties by P- and S- ultrasonic waves, *Construction and Building Materials* 139 (2017) 334-341.
- G. Barluenga, J. Puentes, I. Palomar, O. Rio. Early Age Drying Shrinkage Evaluation of Self-Compacting Concretes and Pastes with Mineral Additions. *CONCREEP 10*. American Society of Civil Engineering, ISBN: 978-0-7844-7934-6 (2015). Pp. 1514-23. DOI: 10.1061/9780784479346.177.
- N. Flores, G. Barluenga, F. Hernandez-Olivares. Combined effect of Polypropylene fibers and Silica Fume to improve the durability of concrete with natural Pozzolans blended cement. *Construction and Building Materials* (2015), vol 96, p 556-66.
- G. Barluenga, J. Puentes, I. Palomar. Hardened properties and microstructure of SCC with mineral additions. *Construction and Building Materials* (2015), vol 94, p 728-36.
- G. Barluenga, J. Puentes, I. Palomar. Early age monitoring of self-compacting concrete with mineral additions. *Construction and Building Materials* (2015), vol 77, p 66-73.
- J. Puentes, G. Barluenga, I. Palomar. Effect of silica-based nano and micro additions on SCC at early age and on hardened porosity and permeability. *Construction and Building Materials* (2015), vol 81, p154-161.
- A. M. Marín, G. Barluenga. Eladio Dieste y la cerámica armada: la forma de lo resistente. *Arquitecturas del Sur* 2015. Vol. 32 (45), p 90-103 (AVERY)
- J. Puentes, G. Barluenga, I. Palomar. Effects of nano-components on early age cracking of selfcompacting concretes. *Construction and Building Materials* (2014), vol 73, p 89-96.
- G. Barluenga, J. Puentes, I. Palomar, Early age and hardened performance of cement pastes combining mineral additions, *Materials and Structures*, 46 (6) (2013) 921-941.

## C.2. Research projects and grants (last 10 years)

- (HORIZON-MSCA-2021-SE-01- 101086440) Bio-based Energy-efficient materials and Structures for Tomorrow. European Union (granted), 2022-2026. Coordinator institution:



TU Darmstadt (Prof. E. Koenders). Role: Principal Investigator UAH Group (Total budget: 726800 €, UAH group: 92000€)

- PID2019-106525RB-I00, Rheological control and early age monitoring of nanomodified cement-based systems for 3D printing (Print3Dcement); MICINN, 2020-2023. Role: Principal Investigator. (118.580 €)
- CM/JIN/2019-046, Design and characterisation of pervious lime-cement mortars and multi-layer products with improved hygrothermal and acoustic performance for indoor applications (IndoorComfort), Research Program for the Promotion of Young Researchers, co-funded by Comunidad de Madrid and Universidad de Alcalá (Spain), 2020-2022 (27 months). Role: Researcher. (15.000 €)
- (BIA2016-77911-R) Nanoengineered Self-compacting mixes for improved cast in-place and early age performance. Multiscale characterization and experimental methodology; MINECO, 2016-2019, Role: Principal Investigator (132.000 €).
- (NSF Award 1455466) RSB: Performance-based Decision Support System for Resilient and Sustainable Multi-Hazard Building Design; National Science Foundation USA ,2015-2018, Investigadora principal: Dr. Madeleine Flint, Virginia Tech), Role: Reseracher (\$ 1,260,000.00).
- (PPII14-22-P) Early age performance and durability of SCC for Building and Architectural Heritage Rehabilitation; Junta de Comunidades de Castilla-La Mancha, 2014-2017, Role: Principal Investigator (55.000 €)
- (BIA2013-48480-C2-2-R) Pumpability Evaluation of Self Comapcting Concretes using Performance Indicators; MINECO, 2014-2016, Role: Principal Investigator of coordinated project (66.550 €)
- (S2009/Mat-1629) Geomaterials. Durability and Conservation of Heritage Materials, Programa coordinado Comunidad de Madrid, 2010-2013; Coordinator: Rafael Fort, Role: Principal Investigator UAH Group (Total: 990.000 €, Grupo UAH: 80.000€)
- Programa de incorporación permanente de Investigadores I3. Ministerio de Educación. 2009-10, Role: Principal Investigator (135.000€).
- (CCG08-UAH/MAT-4038) Influence of type and amount of fines on early age performance of Self Consolidating Concretes for Architectural Heritage; UAH-Comunidad de Madrid, 2009-2010, Role: Principal Investigator (24.930 €)

#### C.4. Patents

- H. Varela, G. Barluenga. National Patent number: P2016-00785. Application date: 26/09/2016. International number: 300248121 (WO 2018/055225 A1), Application number PCT PCT/ES2017/070627, Frameless ventilated façade with intermadiate folded metallic sheet forming ribs. Holding institution: Universidad de Alcalá.
- I. Palomar, G. Barluenga. National Patent subject to preliminary examination number: P2014-00305, Publication number: ES2548221, Lime-cement mixtures with enhanced thermal and acoustic propeerties. Aplicattion date 10/04/2014. Holding institution: Universidad de Alcalá.

#### C.5. Conference presentations (with published proceedings)

- Varela, H., Barluenga, G., Jacquet Y., Perrot A., 2022, Rheology and extrudability of 3D printing cement-based systems with nanoclays and viscosity modifiers. In: 3rd RILEM International Conference on Concrete and Digital Fabrication, Digital Concrete 2022, Loughborough (UK), 26-29 of July. [POSTER]
- G. Barluenga, J. Puentes, I. Palomar, C. Guardia. Combined NDT techniques for Early Age monitoring of Cement Based Materials. *2nd International RILEM/COST Conference on Early Age Cracking and Serviceability in Cement-based Materials and Structures*, vol 1. RILEM Publications S.A.R.L., ISBN: 978-2-35158-199-5 (2017), p. 113-118.
- C. Guardia, G. Barluenga, I. Palomar. Phase Change Material cement mortars for thermal retrofitting of façades. *Second International RILEM Conference on Bio-based Building Materials*. RILEM Publications S.A.R.L., ISBN: 978-2-35158-192-6 (2017), p. 632-636.
- Barluenga, G; Ladipo , O; Reichard , G; Leon , R T. Cement-based facades for mid-rise commercial sustainable and resilient buildings. *ICCS16 Concrete Sustainability*. ISBN: 978-84-945077-7-9 (2016) p. 241-249.





- A. Rodriguez, G. Barluenga, O. Rio, I. Palomar, K. Nguyen, A. Sepulcre, M. Giménez. Pumpability of sustainable SCC mixtures. *ICCS16 - Second International Conference on Concrete Sustainability*. International Center for Numerical Methods in Engineering, ISBN: 978-84-945077-7-9 (2016) p. 797-808.
- I. Palomar, G. Barluenga, J. Puentes. Assessment by non-destructive testing of new coating mortars for retrofitting the Architectural Heritage. *WIT Transactions on The Built Environment*, vol 153. WIT Press, ISBN: 978-1-84564-968-5 (2015), p. 357-366.
- J. Puentes, G. Barluenga, I. Palomar. Self-Compacting Concrete with Nanosilica and Carbon Nanofibers. *Nanotechnology in Construction, NICOM 5*. K. Sobolev, S.P. Shah (eds.). Springer, Taylor and Francis Group. (2015) pp 493-98. DOI: 10.1007/978-3-319-17088-6\_65.
- G. Barluenga, J. Puentes, I. Palomar. Effect of Particle Size and Amount of Nanosilica and Microsilica on Early Age and Hardened Structure of Self Compacting Concrete. *Nanotechnology in Construction, NICOM 5*. K. Sobolev, S.P. Shah (eds.). Springer, Taylor and Francis Group. (2015) pp 493-98. DOI: 10.1007/978-3-319-17088-6\_64.
- R. Undurraga, J.F. Conde, F. del Agua, G. Barluenga, M.A. Villegas, M. Garcia Heras. Historical and experimental integrated study on brick masonry identification: comparison of two heritage buildings in the city of Alcala de Henares (Madrid, Spain). *Science, Technology and Cultural Heritage*. CRC Press/Balkema (Taylor & Francis Group), ISBN: 978-1-138-02744-2 (2014), p. 95-101.
- M. Sklodowski, M. Alvarez de Buergo, G. Barluenga, R. Fort. Assessment of mechanical properties of the historical bricks of Burgos Gate in Alcala de Henares in Madrid. *SAHC2014 &- 9th International Conference on Structural Analysis of Historical Constructions*. Ciudad de Mexico (México). 2014, p. 1-8.
- J. Puentes; G. Barluenga; I. Palomar, Early age behaviour of Self Compacting Concrete with Polypropylene fibers and Carbon nanofibers in Fibre Reinforced Concrete: Challenges and Opportunities (*RILEM Proceedings, PRO 88 RILEM*), Ed. J Barros et al., RILEM; ISBN: 978-2-35158-132-2; e-ISBN 978-2-35158-133-9, (2012) pp 1-12.

#### **C.6. Responsibilities as evaluator and reviewer**

- Reviewer of JCR indexed journals: Cement and Concrete Research, Cement and Concrete Composites, Construction and Building Materials, International Journal of Cultural Heritage, ASCE Journal of Materials in Civil Engineering, Indian Journal of Engineering & Materials Sciences, KSCE Journal of Civil Engineering, Materiales de Construcción, Nanomaterials and Nanotechnology Letters, Scientia Iranica, Journal of Energy Storage.
- Expert evaluator of the Spanish Research Evaluation Agency in Construction, Civil Engineering and Architecture.

#### **C.7. Other merits**

Head of the Department of Architecture of the UAH (2008-2011). Promoter and first Director of the PhD Program in Architecture UAH (2008-2011) and Coordinator (2016-2020).