

(a) Curriculum Vitae for Joan Ramón Morante Lleonart



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and

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Date of birth: November 19th, 1953, Mataró. Spain.

Citizenship: Spanish

Degrees: 1977 Physics degree, University of Barcelona, Barcelona, Spain.

1977 Final Physics degree examination: “A” level. University of Barcelona.

1980 PhD in Physics, University of Barcelona.

1980 Award for the best PhD University of Barcelona

Other awards: Narcís Monturiol medal, senior distinction from Generalitat de Catalunya.

Research fields and activities:

His activities were centred in electronic materials and devices; semiconductors and electronics ceramics, the assessment of their related technologies and production processes, specially emphasizing materials technology transfer. He was also involved on nanomaterials for sensors, actuators and Microsystems, especially on chemical sensors. He is now focussed on “nano energy” addressing effort to the energy transfer mechanisms in solid interfaces involving electrons, photons and phonons as well as chemicals and photoelectrochemical processes. Likewise, he is specialized in the development of renewable energy devices and systems for applications in the field of energy and environment based on nanomaterials and their functionalization. His special attention is focussed on advanced materials and systems for energy storage and energy conversion mainly oriented to materials for solar energy applications, including its storage. Additional research activities also include nanomaterials for solar-fuels synthesis via photo-catalytic and photo electrochemical processes. He has taken part in R&D international projects (>25) in the programmes BRITE, Growth, priority 3 in 6FP, NMP in FP7, ESPRIT, IST, priority 2 in 6FP, ICT in FP7, JOULE, Energy... and industrial projects in programmes EUREKA, IBEROEKA, CRAFT, as well as in private industrial projects.

He has co-authored more than 500 works in international specialized journals, (h \approx 51 ISI web of knowledge & Scopus data bases), with more of 10000 citations, several proposal patents (10) and he has been advisor of more than 35 PhD students; he is member of international committees and editorial boards of scientific journals. He has been general chairman of international events and has been guest editor of many special issues. He has been awarded the Narcís Monturiol of the Generalitat of Catalunya, and the “senior research distinction” of the Generalitat of Catalunya. Actually, he is vice president of the European Materials Research Society

Employments:

- 1977-80. Assistant professor in the Department of Applied Physics, University of Barcelona. Barcelona. Spain.
- 1980-82. Substitute associate professor at the department of applied physics and electronics, Physics department, University of Barcelona. Spain.
- 1982-86. Associate professor (profesor adjunto numerario) at the department of applied physics and electronics, Physics department, University of Barcelona. Spain.
- 1986-94. (Full) Professor of Electronics, Department of Applied Physics and Electronics, Faculty of Physics, University of Barcelona, Barcelona. Spain.
- 1994–. (Full) Professor of Electronics Physics, Department of Electronics, Faculty of Physics, University of Barcelona, Barcelona. Spain.

Commissions of trust:

- Vice Dean for Economical Affairs Faculty of Physics, University of Barcelona. 1984-1988
- Vice Dean for Research Affairs, Faculty of Physics, University of Barcelona. 1988-1991
- Dean of the Faculty of Physics, University of Barcelona, 1991-1993
- Academic director of Electronics Engineering career, Faculty of Physics. 1993-1994
- Head of the Department of Electronics, Faculty of Physics, University of Barcelona. 1994-1998
- Council Member of the Fundació Bosch i Gimpera of the University of Barcelona, 1990-2004
- Council Member of the “Serveis Científico Tècnics” de la University of Barcelona, 1991-2006

- Head of CeRMAE, Center of Reference on Advanced Materials for Energy of the Generalitat of Catalunya.2003-2007,
- Co-director of the CEMIC, Center for Microsystem Engineering for Instrumentation and Control Systems of the Technological Innovation Centers of the Catalonia Government 2001-2008
- Co-director of the interuniversity (University of Barcelona and Polytechnic University of Catalonia) Master on Energy Engineering 2006-2008
- Coordinator of the Nano Energy Area at the IN2UB institute of Nanoscience and Nanotechnology of the University of Barcelona 2006-2009
- Head of XaRMAE, Network of Reference on Advanced Materials for Energy of the Generalitat of Catalunya. 2007-
- Head of the Advanced Materials for Energy Area of the Catalonia Institute for Energy Research, IREC belonging to CERCA from Catalonia government.2008-
- Head of the consolidate research group M2E “Materials for electronics and energy” of the Catalonia government.2009-2014
- Head of the consolidate research group LCMM 1992-1996 and EME 1996-2009 at the department of Electronics, Faculty of Physics, University of Barcelona.

Publication record:

- Approximately more of 650 titles, mainly in refereed journals and conference proceedings including all data bases. (More than 500 titles on ISI Web-of-Science taking only web of science or Scopus)
- H-index (SCOPUS & ISI web Knowledge): 51
- More than 10000 citations (isi-knowledge & SCOPUS) and a citation average for paper higher than 18 excluding proceeding origin papers.
- Books, proceedings volumes and special issues as guest editor, etc:***

- More than 25 titles

Conference, workshop and seminar participations:

- More than 200 invited talks in conferences, workshops, seminar, university and research centers; chair at more than 25 international meetings, mainly on materials for electronics and energy as well as sensors and Microsystems or energy devices.

Academic actions:

- Invited lectures in Europe, Asia, North and South America, Australia

Other present duties:

- Elected member of the steering committee of Transducers and general chairman for Transducer 2013.
- Elected member of the steering committee of Eurosensors and general chairman for Eurosensors 2013
- Elected vice president of the European Materials Research Society (responsible of the materials for energy and international relationships task force). Previously member of the executive committee of the European Material Research Society
- Elected member of the steering committee of International Meeting on Chemical Sensors, IMCS.
- Consultant to numerous agencies, companies and editorial boards.
- Member of different scientific and technological networks and technological platforms.
- Member of numerous program committees of conferences and specialized workshops.

Succinct last year funding(2009-2012):

- Spanish MICINN CONSOLIDER program CSD2009-00050 Multicat: “Desarrollo de catalizadores más eficientes para el diseño de procesos químicos sostenibles y producción limpia de energía” & MICINN Cenit program: CEN-1027 “Nuevas utilizaciones industriales sostenibles del CO₂”. Industrial subcontractor. MICINN MAT2010- 21510 Nano-en Esto: “Materiales multifuncionales en nano arquitecturas 3D para la conversión y almacenaje de energía”
- EU FP7 NMP-2012 31033 SOLAROGENIX “Water oxidation nanocatalysts for sustainable solar hydrogen production through visible-light activity”; EU FP7 NMP-2012 309984 CEOPS “CO₂ - Loop for Energy storage and conversion to Organic chemistry Processes through advanced catalytic Systems”; EU FP7 ICT 2011- 288481 SOI-HIT “Smart Silicon-on-Insulator (SOI) Sensing system operating at High Temperature”; EU FP7 People program IRSES2011-295216 WIROX “Oxide nanostructures for wireless chemical sensing”; EU Cost action program OC-2011-1-9706 “Eu-air-net” EU FP7- ENERGY-2013.7.3.3 n° 608621 INFLUENCE " Interfaces of Fluid Electrodes: New Conceptual Explorations "
- EU FP7 European Institute of Technology, EIT. KIC Innoenergy projects nano for energy storage
- Industrial contracts: A new JPI (Joint Industrial Projects) on nano materials for solar fuels.

b Track record.

Top 10 publications in the last 10 years.

The list is composed by 5 significant recently published contributions (2009-2013) and by 5 representative papers of my previous research periods. *All of these presented papers have been selected among my publications contained at least in the world top 1% (ISI-Knowledge at 1 January 2014) in science material area.* Citations (**excluding self-citations**) are shown (Scopus source at January 2014). In all the listed papers I'm the senior author of my research group (last author); in case of joint papers with other groups, the last author of the paper may result different from me because of a different agreement has been reached among co-authors. Recent covers: *Journal of Materials Chemistry* 19(7) (2009); *Lab on Chip* 9(11) 2009 and *Nanotechnology* 48 (49) (2007).

1.-Influence of average size and interface passivation on the spectral emission of Si nanocrystals embedded in SiO₂. Fernandez, BG; Lopez, M; Garcia, C; Perez-Rodriguez, A; Bonafos, C; Carrada, M; Claverie, A.; Morante, JR. *Journal of Applied Physics* 91 (2) Pages 798-807(2002) Cited 195 times and 17,72 by year.

2.-Effects of Nb doping on the TiO₂ anatase-to-rutile phase transition. Arbiol J; Cerda J; Dezanneau G; Peiro F; Cirera A; Cornet A; Morante JR. *Journal of Applied Physics* 92(2) Pages 853-861 (2002) Cited 143 times and 13 by year.

3.-Cr-doped TiO₂ gas sensor for exhaust NO₂ monitoring. Ruiz AM; Sakai G; Cornet A; Shimanoe K; Yamazoe N; Morante JR. *Sensors and Actuators B-Chemical* 93 (1-3) Pages 509-518 (2003) Cited 120 times and 12 by year.

4.-Nanostructured metal oxides synthesized by hard template method for gas sensing applications. Rossinyol, E; Arbiol, J; Peiro, F; Cornet, A; Tian, B; Bo, T; Zhao, D; Morante, JR. *Sensors and Actuators B-Chemical* 109 (1) Pages 57-63, (2005) Cited 99 times and 12,37 by year.

5.-Synthesis and characterization of chromium-doped mesoporous tungsten oxide for gas-sensing applications. Rossinyol E, Prim A, Pellicer E, Arbiol J, Hernández-Ramírez F, Peiró F, Cornet A, Solovyov LA, Tian B, Bo T, Zhao D, Morante JR *Advanced Functional Materials* 17(11) Pages 1801-1806. 23 July 2007. Cited 87 times and 14.5 by year

6.- High mobility indium free amorphous oxide thin film transistors Fortunato, E.M.C., Pereira, L.M.N., Barquinha, P.M.C., Botelho Do Rego, A.M., Gonçalves, G., Vila, A., Martins, R.F.P. Morante, J.R.; *Applied Physics Letters*, 92 (22), art.no.222103, 2 June 2008. Cited 75 times and 15 by year.

7.- Structural and optical properties of high quality zinc-blende/wurtzite GaAs nanowire hetero-structure Spirkoska, D., Arbiol, J., Gustafsson, A., Conesa-Boj, S., Glas, F., Zardo, I., Heigoldt, M., Gass, M.H., Bleloch, A.L., Estrade, S., Kaniber, M., Rossler, J., Peiro, F., Morante, J.R., Abstreiter, G., Samuelson, L., Fontcuberta & Morral, A. *Physical Review B*, 80(24), 245325, 15 December 2009. Cited 114 times and 28.5 by year.

8.- Direct correlation of crystal structure and optical properties in wurtzite/zinc-blende GaAs nanowire heterostructures. Heiss, M. Conesa-Boj, S., Ren, J., Tseng, H.-H., Gali, A. Rudolph, A. Uccelli, E., Peiró, F., Morante, J.R., Schuh, D. Reiger, E., Kaxiras, E., Arbiol, J., Fontcuberta I Morral, A. *Physical Review B*, 83 (4), Article number 045303; 20 January 2011. Cited 49 times and 16.3 by year.

9.- Polarity Assignment in ZnTe, GaAs, ZnO, and GaN-AlN Nanowires from Direct Dumbbell Analysis. Mata M, Magen C, Gazquez J, Iqbal M, Utama B, Heiss M, Lopatin S, Furtmayr F, Fernández-Rojas JC, Peng B, Morante J.R., Rurali R, Eickhoff M, Fontcuberta & Morral A, Xiong Q, Arbiol J. *Nanoletters* 12 (5) Pages 2579–2586, 9 May 2012. Cited 36 times and 18 by year.

10.- Self-assembled quantum dots in a nanowire system for quantum photonics Heiss, M.; Fontana, Y.; Gustafsson, A.; Morante, J.R., Arbiol, J., Zunger, A., Fontcuberta I Morral, *Nature Materials* 12, 5, 439-444 (2013) Cited 29 times and 29 by year.

Relevant Research monographs, chapters in collective volumes or special issues (>2002):

- Sensors and actuators a-physical vol 99 issue 1-2 (2002) guest editor special issue
- Sensors and actuators b-chemical vol 84, issue 1 (2002) guest editor special issue
- Microelectronics Engineering Volume 72, Issues 1-4, April (2004) guest editor special issue
- Sensors and actuators B-chemical vol 109, issue 1 (2005) guest editor special issue
- Sensors and actuators a-physical vol 132, issue 1 (2005) guest editor special issue
- Sensors and actuators b-chemical vol 118, issue 1-2 (2006) guest editor special issue
- Functional materials for Micro and nanosystems, E-MRS Symp Proc. Vol 196 Elsevier Science Ltd.(2006)
- Nanosensors: Controlling Transduction Mechanisms at the Nanoscale Using Metal Oxides and Semiconductors. Sensors Based on Nanostructured Materials.*, ISBN: 978-0-387-77752-8. (2009) Co-author
- Nanowires: Advanced Electron Microscopy Techniques on Semiconductor Nanowires: from Atomic Density of States Analysis to 3D Reconstruction Models*". ISBN: 9789537619794. (2010) Co-author.
- STOA Workshop E-MRS Conferences CO₂: a future chemical fuel. European Parliament Brussels. (2011)

Recent Patents:

- Multisensor microchips which is used to measure gas flow, temperature and concentration in order to control combustion, production method thereof and use of same. (W04070080ES)
- Procedure for manufacturing silicon carbide films by ion implantation and thermal annealing (W0100128ES)
- Improvement of gas sensor selectivity by using zeolite films (P2221579B1ES)
- Gas concentration sensor, sensor networks and procedures for the concentration measurements from these sensors (P24697ES00)
- Gas sensor, equipped with threadlike nanostructures, network of sensors and measurement method using said sensor (PCT/EP2010/051206)
- Procedure for the measurement of carbon monoxide and humidity based on the use of nanostructures. (P201030102)
- Monitoring and control system for chemical and electrochemical deposition of thin film layers. (P201030945)
- Photoactivated sensor for determining gas concentration, network of sensors and procedure for the gas concentration measurement using these sensors. (P200930050)

Invited presentations at conferences (partial list recent contributions):

- American Ceramic Society International Conference & Exposition on Advanced Ceramics & Composites (ICACC) Daytona FL (USA) (2009, 2010, 2011, 2012,)
- MRS Spring Meeting San Francisco CA (USA) (2005, 2006, 2012)
- MRS Fall Meeting Boston MA (USA) (2007, 2010, 2011)
- FUMAT Warsaw (Poland) September 22-23 (2011)
- PACRIM Nanostructured materials for energy Cairns (Australia) July 11-14 (2011)
- Nanomaterials and nanodevices for ecological security. Nato Advanced Research Workshop. Riga (Lvtuania) June 20-23 (2011)
- Bilateral Energy Conference MRS-EMRS May 8-13 Nice (France) (2011)
- Symp. on materials for sustainable energy. PREM Penn-UPRH workshops. Puerto Rico (USA) May 6 2011
- STOA European Parliament Brussels March 22 (2011)
- Advanced materials&technologies for global energy and environmental challenges. Pretoria (South Africa) December 6-9 (2010)
- Transparent Conductive Materials Crete (Greece) September (2009, 2010, 2012)
- Symposium on Re-use of CARBON DIOXIDE: from photo-reactors to the green production of fuels. Fall meeting EMRS Warsaw (Poland) September (2010)
- International Meeting on Chemical Sensors, IMCS. Perth (Australia) July (2010)
- Nano'09 INL Braga (Portugal) December 10-11 (2009)
- ACCS 2009. Daegu (Korea) November (2009)
- ISOEN Brescia (Italy) April (2009)
- International Conference Nanotech Insight. Barcelona (Spain) March29-April 2 (2009)

Organization of international conferences (partial list > 2002):

- INFOS11 insulators formation on semiconductors at Barcelona. (Spain) (2003)
- Symposium Fall meeting E-MRS Warsaw (Poland) 2004
- Eurosensors 2005 at Barcelona and next 2013
- Symposium Spring meeting E-MRS (1994, 1997, 2000, 2005) Symposium on Nano Energy at the bilateral energy conference MRS-EMRS Nice (France) 2011
- General Chairman Spring meeting E-MRS 2009
- European Energy Conference E2C 2010 at Barcelona
- Co chair Bilateral Energy Conference MRS-EMRS Nice (France) 2011
- General chair Fumat 2011 Track 1 Materials for energy. Warsaw (Poland) 2011
- General chair Eurosensors 2013 at Barcelona
- General chair Transducers 2013 at Barcelona

Awards and academy memberships:

- Narcis Monturiol Medal from Generalitat de Catalunya (1999) Senior Scientist distinction from Catalonia Government (2001)

Memberships in editorial boards:

Material Letter (up to 2004), Semiconductor Physic, Quantum Electronic&Optoelectronics. Ukraine Sciences Academia. Material Science Forum. Transtec y Scientec Publishing Co Journal of Sensors Hindawi editors.