

Alain M. JONAS

Université catholique de Louvain

Full Professor, Louvain School of Engineering

Vice-President, Institute of Condensed Matter and Nanosciences

Member of the Royal Academy of Science, Letters and Fine Arts of Belgium

Professional Address:

IMCN/BSMA
Croix du Sud, 1 bte L7.04.02
1348 Louvain-la-Neuve; Belgium
phone : +32/10/47 37 65

Home Address:

Alain Jonas
Rue Jean Haust, 5/103
1348 Louvain-la-Neuve; Belgium
mobile : +32/477/25 21 45

alain.jonas@uclouvain.be; <http://perso.uclouvain.be/alain.jonas>

Born in Belgium on October 30, 1963 – Belgian citizen



Research focus & thematic mobility

My core expertise is in **polymer science, nanotechnology and macromolecular assembly**.

This includes the study of the **crystallization, structure and properties of long chain molecules** for structural and functional applications; the study of the **physical chemistry of surfaces, interfaces and thin films**; the development of **nanolithography and patterning**; and the use of **controlled assembly** at the sub-micrometer scale. I am specially interested in the assembly of synthetic macromolecules to generate functional materials and bio-materials.

Current applications of my research are ferroelectric and magnetoelectric devices, stimuli-responsive polymer layers for biological applications, self-cleaning superhydrophobic surfaces made by aqueous-based process, and layer-by-layer-assembled (bio-)functional systems.

Academic positions & international mobility

- 2016-2017 Visiting professor, **MIT, USA** (Robert S. Langer's group, 11 months)
- 2008-pres. Full Professor, **Université catholique de Louvain, Belgium**
- 2007-2008 Leverhulme Visiting Professor, the **University of Cambridge, UK** (Wilhelm Huck's group, 12 months)
- 1995-2007 Assistant Professor, then Lecturer, then Professor, Université catholique de Louvain, Belgium
- 1993-1995 Postdoctoral Researcher of the Belgian National Fund for Scientific Research (FNRS)
- 1992-1993 Postdoctoral Visiting Scientist, **IBM Almaden Research Center, USA** (Do Yoon's and Thomas Russell's groups, 12 months)
- 1986-1991 Research Fellow of the Belgian National Fund for Scientific Research (FNRS)

Degrees & breadth of education

- 1992 Ph.D. in **Materials Science**, Université catholique de Louvain, Belgium
- 1986 Minor degree in **Philosophy**, Université catholique de Louvain, Belgium
- 1986 Engineering degree in **Materials Science**, Université catholique de Louvain, Belgium

Bibliometric data & numbers

citations & h-factor

8600+ & 47 (Google Scholar, author: Alain M. Jonas)

6500+ & 42 (Thomson Researcherid J-5232-2012, data from Web of Knowledge)

203 articles published in books or peer-reviewed international journals, including articles in *Nature*, *Nature Materials*, *Nature Commun.*, *Angew. Chem. Int. Ed.*, *Nano Letters*, *ACS Nano*, *Adv. Materials*, *J. Am. Chem. Soc.*, *Small*, *Macromolecules* and *Langmuir*

complete list available at <http://perso.uclouvain.be/alain.jonas>

numerous communications and invited lectures (among which at meetings of the American Physical Society, the American Chemical Society, Gordon Research Conference and Flash ERA-Chemistry)

4 patents

Awards and personal grants

2016	Fulbright fellowship
2016	Marcel de Merre "out" prize for nanotechnology
2015	Elected member of the Royal Academy of Science, Letters and Fine Arts of Belgium
2007	Runner-up Obducat Prize
2006	Leverhulme visiting professorship
1992	Fulbright fellowship

Main academic responsibilities

2015-	Vice-President of the Institute of Condensed Matter and Nanosciences (September 2015 - ...)
2007-2018	Member of the governing board of the EU-funded FAME international master (2007-2018)
2009-2020	Member of the governing board of the EU-funded IDS-FunMat & EJD-FunMat International Doctoral Schools (2009-2014 & 2015-2020)

Past

2010-2013	Chair of the "Bio & Soft Matter" Division of the Institute of Condensed Matter and Nanosciences - UCL/IMCN/BSMA
2009-2010	President of the Commission for Bachelor Engineering Studies - UCL/EPL/BTCI
2003-2008	President of the Commission for the degree in Materials Science Engineering

Editorial and reviewing duties

Serving as reviewer or referee (40 to 50 reviews/year) for

journals: *Macromolecules, J. Polym. Sci. : Polym. Phys. Ed., Polym. Eng. Sci., J. Mater. Res., Langmuir, Polymer Int., J. Appl. Crystallogr., J. Mater. Sci., J. Am. Chem. Soc, Chem. Mater., J. Phys. Chem. B, Cryst. Growth Design, Chem. Phys. Chem., Funct. Adv. Mater., Biomacromolecules, Adv. Mater., Nature Materials, Nature Commun., Proc. Nat. Acad. Sci. USA, Small, Soft Matter, Nano Letters, ACS Nano, Angew. Chem. Int. Ed.*

research agencies: *NSF (USA), European Commission, NWO (the Netherlands), DFG (Germany), Belspo (Belgium), FWO (Belgium), ANR (France), Fondation Nanosciences (France), FNRS (Belgium), ACS Petroleum Research Fund, DPI (The Netherlands), Labex-FRC, HCERES (ex-AERES, France), Israel Science Foundation, Fonds des leaders (Quebec)*

Lectures and classes

2013-	<i>Physical Chemistry (thermodynamics)</i> , LFSAB 1301, 400+ engineering freshmen, Lectures combined with in-class quizzes + podcasts
1999-	<i>Polymer Science & Engineering</i> , LMAPR 2019, 50-60 engineering master students. Flipped classroom format (SPOOC)
2013-	<i>Project in Polymer Science</i> , LMAPR 2016, 15-20 master students. Project-, laboratory- and web-based learning around 3D printing (Fused Deposition Modelling)
1999-	<i>Polymer Chemistry and Physical Chemistry</i> , LCHM 2261, ca. 15 master students. Flipped classroom & case studies
2012-	<i>Project in materials science</i> , ca. 30 master students of the international FAME master. Remotely-led web-based Moodle project, with students in Augsburg (DE) and in France (Grenoble)
<i>Past</i>	
2001-2014	LFSAB 1203, Wave Physics, ca. 300 sophomore engineering students. Problem-based learning & classical class
2007-2013	LMAPR 2012, Macromolecular Nanotechnology, 20 master students. Project-based learning

Current PhD students & topics of research

2017-	Wanlin Xu: <i>bacteria-containing microtubes</i> (coll. K. Glinel, S. Demoustier)
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- 2016- Matthieu Lemaître: *multiferroic materials* (coll. B. Nysten, L. Piraux)
- 2016- Eléana Somville: *new porous microcarriers for stem cell culture* (coll. K. Glinel)
- 2015- Mirasbek Kuterbekov: *surface biofunctionalization of porous 3D scaffolds for bone tissue engineering* (coll. K. Glinel UCLouvain + C. Picart Grenoble)
- 2015- Bruno Aor: *engineered microchannels for vascularization* (coll. S. Demoustier UCLouvain + M.-C. Durrieu U. Bordeaux)
- 2014- Guillaume Staelens: *self-assembled reconfigurable hybrid materials* (coll. B. Nysten)
- 2013- Pedro Pereira de Sa *multiferroic hybrid materials* (coll. L. Piraux)

PhD students (alumni) & thesis title	
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| 11/2016 | Zhuang Pengyu: <i>Temperature Dependence of Volume and Surface Properties of Thermo- and Photo-Responsive Polymer Brushes</i> (with K. Glinel) |
| 11/2016 | Zhang Shouwei <i>Layer-by-Layer Assembled Enzyme Nanotubes and Mats for Biocatalysis</i> (with S. Demoustier) |
| 9/2016 | Ronggang Cai: <i>Nanoimprinted Ferroelectric Polymer Layers for Organic Memory Devices and Multiferroism</i> |
| 12/2015 | Saghi Saghadzadeh: <i>Polyelectrolyte Multilayer Nanotubes for Drug Delivery Applications</i> (with S. Demoustier) |
| 09/2104 | Diana Ramirez-Wong: <i>Brushes of Self-Assembled Nanotubes for Temperature-Responsive Catalysis</i> (joint PhD with U. Paris 6) |
| 05/2014 | Hailu G. Kassa: <i>Electrical and Structural Properties of Nano-imprinted Ferroelectric Polymers</i> |
| 12/2013 | Annie Zhe Cheng: <i>Biological multi-functionalization and surface nanopatterning of biomaterials</i> (joint PhD with U. Bordeaux) |
| 08/2012 | Cécile Bollinne: <i>Structural Characterisation of Supported Thin Polymer Films</i> |
| 02/2012 | Bertrand Mathy: <i>Polymer Brushes and AFM Cantilevers for Nanosensing and Catalysis</i> (with B. Nysten) |
| 01/2012 | Xavier Laloyaux: <i>Understanding, Tuning and Using the Collapse Transition of Thermoresponsive Polymer Brushes</i> (with B. Nysten) |
| 01/2012 | Cécile Roy: <i>Membrane-Templated noatubes as potential candidates for gene delivery applications</i> (with S. Demoustier) |
| 12/2008 | Pierre-Olivier Mouthuy: <i>Nanogroove networks for aligning columns of liquid-crystalline phthalocyanines</i> (with S. Melinte) |
| 09/2008 | Veronica Borcea: <i>Radioactive ion implantation of thermoplastic elastomers</i> |
| 09/2007 | Halima Alem: <i>Nano-confined polymers: from stimuli responsive membranes to self-assembled nanotubes</i> (with S. Demoustier) |
| 12/2006 | Gabriel Baralia: <i>3D Transcription of 2D Binary Chemical Nanopatterns by Block-Copolymer Dewetting</i> (with B. Nysten) |
| 12/2006 | Nadia Frederich: <i>Nano-patterned photoactive surfaces</i> (with J.-L. Habib-Jiwan) |
| 12/2004 | Antoine Pallandre: <i>Macromolecular Assemblies onto Chemically Nanopatterned Surfaces</i> (with B. Nysten) |
| 10/2003 | Hugues Haubruge: <i>The Nucleation of Poly(ethylene terephthalate) by the Phyllosilicate Talc</i> (with R. Legras) |
| 06/2003 | Xavier Gallez: <i>The Formation of Smectic Phase in Quenched Isotactic Polypropylene: Role of Molecular Parameters and Processing Conditions.</i> |
| 05/2001 | Cédric le Fevere de Ten Hove: <i>Controlling Solid-State Microstructure of Semi-Crystalline Polymers Through Chemical Design of Chains : a Study of Model Polyesters</i> (with J. Penelle) |
| 03/2000 | Xavier Arys: <i>Understanding Ordering in Polyelectrolyte Multilayers : Effect of the Chemical Architecture of the Polycation</i> |

04/1999 Olivier Dupont: *Study of the Relationship Between Crystalline and Amorphous Regions in Semi-Crystalline Poly(ether-ether-ketone)* (with R. Legras)

Ongoing grants & topics

2017	Excellence of Science (EoS) project 'Precision', principal investigator
2016	InterReg V France – Wallonie – Vlaanderen project, DURATEX: Antistain and antimicrobial textiles, principal investigator
2015	EU H2020-MSCA-ITN-2014, project 641640, European Joint Doctorate EJD-FunMat, principal investigator
2015	EU H2020-NMP-2014, project 646272, Biocapan (BIOactive implantable CAPsule for PANcreatic islets immunosuppression free therapy), associated investigator
2015	FEDER, Multi-functional coatings/1 – Prostem (Biofunctional coatings for the culture of stem cells), associated investigator
2015	FEDER, Multi-functional coatings/2 – Biodec (Durable bioactive coatings for environmental depollution), principal investigator
2013	French Community of Belgium ARC 13/18-052, Supracryst (Hybrid supracrystalline functional layers: from reconfigurability to multifunctionality), associated investigator

Major previous grants & topics

2014	FNRS project T.0047.14, Ferrocrystal (Ferroelectric properties of single crystals of polyamides of sequenced molecular architecture), principal investigator
2012	Belgian Science Policy – IAP phase 7, IAP network on Supramolecular Functional Systems, principal investigator (UCL coordinator)
2011	Wallonia Region, Greenomat program, project 1117317 CleanOptic (Superhydrophobic anti-reflection coatings for solar glass panels), principal investigator
2010	EU, FP7 project 248092, MOMA (Embedded Organic Memory Arrays), principal investigator
2009	EU, Erasmus Mundus Action 1 – joint doctorate program, IDS-FunMat (International Doctoral School in Functional Materials), principal investigator (UCL coordinator)
2007	Belgian Science Policy – IAP phase 6, IAP network on Supramolecular Functional Systems, principal investigator (UCL coordinator)
2006	French Community of Belgium – ARCo6/11-339 DynanoMove (Controlling Motion and Dynamical Phenomena at the Nanometer Scale), principal investigator
2005	Wallonia Region, Excellence program, project 516246 Nanotic-Feeling (Development of new sensing systems for biological applications), associated investigator
2004	Wallonia Region, "Réseaux" program, project 03/1/5557 CorroNet (Micro- and nano-structured surfaces exhibiting self-cleaning and anti-corrosion properties), principal investigator
2002	Belgian Science Policy – IAP phase 5, IAP network on Supramolecular Chemistry - Supramolecular Catalysis, principal investigator (UCL coordinator)
2002	Wallonia Region, project 01/1/5016 Nanosens (Development of fast and cost-effective nano-bio-sensors), principal investigator
2000	French Community of Belgium – ARC 00/05-261 Nanorg (Understanding and controlling macromolecular self-assembly at the nanoscale), principal investigator
1999	Wallonia Region, Development of a fast nanolithography technology : nanoimprint, principal investigator
1998	Research contract, Solvay Polyolefins Europe, Structure of polypropylene for biorientation, principal investigator

Scientific membership

American Physical Society (Division of Polymer Physics)

American Chemical Society (Division of Polymeric Materials: Science and Engineering; Division of Colloids)
Belgian Polymer Group
Groupe Français des Polymères

Popularizations and public appearances

2018	General public conference in the Brussels city Hall on daily life nanotechnology (March 13, 2018).
2012	TV and press interviews for the launch of the project CleanOptic, with the Minister of Research of Wallonia
2009-2010	General public conferences on nanotechnology ('Connaissance & vie', Jan 2009 & March 2010)
2009	TV interview on superhydrophobic surfaces ('Au quotidien', Nov. 3 2009, National Belgian Television RTBF)
2008	Radio interview on ferroelectric plastic RAM's ('Cocktail curieux', Dec. 16 2008, RTBF-La première)
2008	Radio interview (1h) on nanotechnology ('Tout autre chose', RTBF-La première)
2006	TV interview (TVCom) on rare jobs and nanotechnology ('Les enquêtes de Julie' - "métiers rares" - Thu - June 29, 2006)
2006	Coordinator for a special issue of the UCL journal ("Louvain") on nanotechnology
2003	UCL delegate to the Belgian Economic Mission in California, which was led by HRH the Prince Philippe of Belgium
2003	Actor and scientific counselor for the movie "Nanotechnology" of the European Commission (Research Directorate-General)

Participation to PhD and habilitation juries

UCLouvain:	D. Debier (1995); M. Koetse (2001); R. Morlat (2002); V. De Cupere (2002); J.-F. Baussard (2004); L. Dauginet (2004); L. Keilas (2006); C. Dekeyser (2007); P. Hensenne (2011); K. McEvoy (2012); E. Zuyderhoff (2012); N. Afsharimani (2013); M. Tabasum (2015).
Elsewhere:	E. Dumont (FPMS, Mons, 1999); D. Duweltz (Paris XII, 2002); D. Pointu (Strasbourg, 2002); D. Le Cerf (Rouen, 2003) : habilitation; S. Simon (Rouen, 2003); C. Buron (Besançon, 2004); S. Gabriele (Mons, 2006); S. Coppée (Mons, 2007); M. Kanso (Nantes, 2008); S. Radji-Taleb (Nantes, 2009); A. Olivier (Mons, 2010); T. Patois (Besançon, 2012); G. Rydzek (Strasbourg, 2012); Y. Lei (Bordeaux, 2012); C. de Saint-Aubin (Mulhouse, 2013); B. Kam (Leuven, 2014); J. Proust (Troyes, 2014); F. Jurin (Besançon, 2014); R. Richter (Grenoble, 2014): habilitation; S. Cabus (Leuven, 2015); J. Landoulsi (Paris, 2016): habilitation; Y. Tran (Paris, 2017): habilitation; C. Mortier (Nice, 2017).