

Jean Bernard Lasserre

Curriculum Vitae

1. General

Last name and given name: LASSERRE Jean Bernard

Birth date and place: May 11th 1953, France

Professional address: LAAS-CNRS, 7 Avenue du Colonel Roche 31077, Toulouse Cédex 4, France. **Tél:** 33 561 33 64 15;

Email: lasserre@laas.fr; **web:** <http://homepages.laas.fr/lasserre/>

Research areas: Optimization, Operations Research, Applied Mathematics, Probability, Real Algebraic Geometry.

2. Education:

1973-1976: Ingénieur ENSIMAG, Grenoble

1976-1978: Docteur Ingénieur de l'Université Paul Sabatier, Toulouse, France.

1984: Docteur d'Etat (Sciences), Université Paul Sabatier, Toulouse, France (Mention très honorable).

Professional Experience:

1978-1979: Visiting Scholar with INRIA fellowship at the *Electrical Engineering and Computer Science Department*, University of California at Berkeley.

1979-1980: Military Service

1980-1983: *Attaché de Recherche au CNRS* (LAAS, Toulouse)

1983-1991: *Chargé de Recherche au CNRS*, (LAAS, Toulouse)

1985-1986: *NSF Research Fellow* at the *Electrical Engineering and Computer Science Department*, University of California at Berkeley.

1992-2004: *Directeur de Recherche 2ième Classe au CNRS*, (LAAS, Toulouse)

2004-2014: *Directeur de Recherche de 1ère Classe au CNRS*, (LAAS, Toulouse)

2014 → present: *Directeur de Recherche de Classe Exceptionnelle au CNRS*, (LAAS, Toulouse)

3. International recognition

3.1 Distinctions

- **Invited Speaker** at the *International Congress of Mathematicians* (ICM 2018), Rio de Janeiro, August 2018: Section 16: Optimal Control & Optimization
- **2015 John von Neumann Theory prize**¹ of the INFORMS society
- **2015 Khachiyan Prize**² of the Optimization Society of INFORMS.

¹<https://www.informs.org/Recognize-Excellence/INFORMS-Prizes-Awards/John-von-Neumann-Theory-Prize>

²www.informs.org/Community/Optimization-Society/Optimization-Society-Prizes/Khachiyan-Prize

- **2009 Lagrange Prize**³ in Continuous optimization.
- **ERC-Advanced Grant**⁴ Laureate in 2015 (TAMING project).
- **SIAM Fellow** (class of 2014)
- **Proposed** in 2004 for the CNRS silver medal.
- **Visiting Fellow** of the *Isaac Newton Institute* (Cambridge, UK), 2013
- **Visiting Research Fellow** of UNSW (University of New South Wales, Sydney, Australia), March 2013.
- **French delegate of the Management Committee**⁵ (MC) of the **ICT COST Action TD1207** “Mathematical Optimization in the Decision Support Systems for Efficient and Robust Energy Networks” (2013-2016)
- **CARMA Associate member** (a Priority Research Centre for Computer-Assisted Research Mathematics and its Applications, University of Newcastle, Australia)
- **INRIA Post-Doc Fellowship** (EECS Dept., UC Berkeley, 1978-1979)
- **NSF Research Fellow** (EECS Dept., UC Berkeley, 1985-1986)
- **Paper** *Pricing a class of exotic options via moments and SDP relaxations*, *Math. Finance* 16 (2006), 469–494, with T. Prieto-Rumeau and M. Zervos, nominated by the *Europlace Institute of Finance* (Paris) for the *2006 Best paper in Mathematical Finance*.
- **Paper** *A sum of squares approximation of nonnegative polynomials*, *SIAM J. Optim.* 16 (2006), 751–765, selected in the SIGEST section of *SIAM Review* (*SIAM Review* 49 (2007), 651–669, December 2007).

3.2 Co-organizer of international programs:

- with D. Bertsimas, B. Helton, J. DeLoera, P. Parrilo and M. Putinar, of the theme *Optimisation and Control* for the Winter Quarter 2007 of the 2006-2007 year *Applications of Algebraic Geometry at the Institute of Mathematics and its Applications* (IMA, Minneapolis). <http://www.ima.umn.edu/AlgGeom/>
- with M. Putinar (UCSB, Santa Barbara), M. Charina and J. Stöcher (Dortmund). *Structured Function Systems and Applications* du **Oberwolfach Institute** (Allemagne), February 2013.
- with A.Letchford (Lancaster), M.Schweighofer (Konstanz), and G.Fliege (Southampton). *Polynomial Optimization* program at the Isaac Newton Institute (Cambridge, UK) (July-August 2013)
www.newton.ac.uk/programmes/POP/index.html
- with S. Robins and D. Pasechnik (Nanyang Technological University, Singapore). 3-month program *Inverse Moment Problems* of the **Institute for Mathematical Sciences** (IMS, Singapour), Décembre 2013 - February 2014.

³<http://www.mathprog.org/?nav=lagrange>

⁴An ERC-Advanced grant is a prestigious grant from the European Research Council awarded through a very selective criterion based only on scientific excellence. <https://erc.europa.eu/advanced-grants>

⁵http://www.cost.eu/domains_actions/ict/Actions/TD1207?management

3.3 Invited member of Research Institutes (financial support from the Institute)

- **Simons Institute for the Theory of Computing** (University of California at Berkeley): Plenary speaker at the workshop *Solving Polynomial Equations*, October 2014. <http://simons.berkeley.edu/workshops/algebraicgeometry2014-2> and long-term visitor in the *Bridging Continuous and Discrete Optimization* program (August-December 2017).
- **Isaac Newton Institute for the Mathematical Sciences** (Cambridge, UK). Visiting Fellow, July-August 2013. www.newton.ac.uk
- **Fields Institute for Research in Mathematical Sciences** (Toronto). **Long term visitor** in May 2002 (Thematic year *Computational Challenges in Science and Engineering*), in October 2009 (Fall Thematic Program on *Foundations of Computational Mathematics*). <http://www.fields.utoronto.ca> and invited speaker at the *Modern Convex Optimization and Applications: AN70* workshop in July 2017.
- **Mathematical Sciences Research Institute** (MSRI, Berkeley, USA). **Invited speaker** to the workshop *Semidefinite Programming and Applications* 2002 and **Key Senior Scientist** of the program *Topological Aspects of Real Algebraic Geometry* (2004) (Stay one month in April 2004).
- **Institute of Mathematical Sciences and its Applications** (IMA, Minneapolis, USA). **Long term visitor** of the program *Applications of Algebraic Geometry*, 2006-2007. Also **Invited speaker** to the workshops *Semidefinite Programming and Robust Optimization*, March 2003, *Mixed-Integer Programming*, July 2005, and *Optimization & Parsimonious Modeling* in January 2016. <http://www.ima.umn.edu>
- **Institute of Pure and Applied Mathematics** (IPAM, UCLA, Los Angeles). **CORE participant** of the program: *Modern Trends in Optimization and Its Applications*, September 13 - December 17, 2010 <http://www.ipam.ucla.edu/programs/yearly.aspx?year=2010>
- **American Institute of Mathematics** (AIM, Palo Alto, USA). Participation (on invitation only) to the workshops *Theory and Algorithms of Linear Matrix Inequalities* in 2005, and *Convex Algebraic Geometry, Optimization and Applications* in 2009.
- **Banff International Research Station** (BIRS, Canada, www.birs.ca). Participation (on invitation only) to the workshops *Positive Polynomials and Optimization* in 2006, *Convex Algebraic Geometry* in 2010, and *Optimization and Inference for Physical Flows on Networks* in 2017
- **Banff International Research Station** (BIRS-CMO, Oaxaca, Mexico). Participation to the workshop *Sparse Interpolation, Rational Approximation and Exponential Analysis*, November 2016.

- **Centre International de Rencontres Mathématiques** (CIRM, Marseille). Participation (on invitation only) to the workshops *Polynômes Positifs* in 2005, *Mixed Integer Nonlinear Programming* in 2010, and *Géométrie et algèbre des inégalités matricielles linéaires* in 2013.
- **Institute for Mathematical Sciences** (IMS, Singapour). Participation (on invitation only) to the workshops *Semidefinite Programming and Applications*, January 2006 and *Large Scale Conic Optimization*, Décembre 2012. As well as **Tutorial speaker** in the program *Optimization: Computation, Theory and Modeling* (1 Nov - 23 Dec 2012). <http://www.ims.nus.edu.sg> and co-organiser of the program *Inverse Moment Problems: the Crossroads of Analysis, Algebra, Discrete Geometry and Combinatorics* (11 Nov 2013 - 25 Jan 2014)
- **Oberwolfach Institute** (Germany). Participation (on invitation only) to the workshops *Applied Probability* (December 1994), *Positive Polynomials* (2002), *Structured Function Systems and Applications* (2013), *Real Algebraic Geometry with a view towards Systems Control and Free Positivity* (2014), *Combinatorial Optimization* (2014), and *Mixed-Integer Nonlinear Optimization: A Hatchery for Modern Mathematics* (2015).
- **Institut Henri Poincaré** (IHP, Paris). Invited to give an *advanced course* in January 2011 in the program *Metric Geometry, Algorithms and Groups*. <http://www.ihp.fr/fr/node/331>
- **Centre de Recerca Matemática** (CRM, Barcelona). Advanced course **Optimization** in July 2009 and stay one month in November 2010.
- **Institut de Recherche Mathématique de l'Université de Séville** (IMUS, Séville, Espagne). **Invited speaker** to the *Exploratory Workshop on Mixed Integer NonLinear Programming*, Décembre 2010, and Doctoral course in March 2015.
- **Vietnam Institute for Advanced Studies in Mathematics** (VIASM, Hanoi). A two-weeks Invited visit in September-October 2014 and in March 2016.
- **Institute for Computational and Experimental Research in Mathematics** (ICERM, Brown University, USA). **Invited speaker** to the *Semidefinite Programming and Graph Algorithms* workshop in February 2014 and to the *Computational Non Linear Algebra* workshop in June 2014 (on invitation only).
- **Chern Institute of Mathematics** (Tianjin, China). **Invited speaker** au workshop *Tensors, Matrix and their Applications* in May 2016.

3.3 Plenary or semi-plenary speaker at about 24 International Conferences, symposia and workshops, including:

- *19th International Symposium on Mathematical Programming* (ISMP2006), Rio de

Janeiro (2006) (semi-plenary) • *2nd International Conference on Mathematical Software* (ICMS 2006), Castro-Urdiales, Spain, Septembre 2006 (Plenary) • *2nd International Conference on Algorithmic Operations Research* (AlgOR 2007), Mathematics Department, Simon Fraser University, BC, Canada, January 2007 (Plenary) • *International Symposium on Symbolic and Algebraic Computation* (ISSAC 2007), Waterloo, Ontario, July 2007 (Plenary) • *The International Conference on Nonconvex Programming: Local and Global Approaches. Theory, Algorithms and Applications* (NCP07), Rouen, France, December 2007 (Plenary), • *New Algorithmic Paradigms in Optimization* (Summer School and Workshop), ETH Zurich, June 2008. (Plenary), • *Modeling and Optimization: Theory and Applications 2008* (MOPTA 08), University of Guelph, Ontario, August 2008 (Plenary) • *6th International Conference on Computational Management Science* (CMS 2009), Geneva (Plenary) • *Bi-annual Congress of SMAI* (the french SIAM), La-Colle-sur-Loup, May 2009 (Plenary) • *XXXII Congreso Nacional de Estadística e Investigación Operativa y VI Jornadas de Estadística Pública*, La Coruna, Spain, September 2010 (Plenary) • *The 8th International Conference on Optimization: Techniques and Applications* (ICOTA 8), Shanghai, Chine, Décembre 2010 (Plenary) • *Optimization 2011*, Lisbon, Portugal, July 2011 (Plenary) • *36th Conference on the Mathematics of Operations Research*, Lunteren (Pays Bas), January 2011 (International Speaker) • *SMF-VMS Joint Congress* (Société Mathématique de France et Société Mathématique Vietnamienne), Hué, 2012 (Plenary) • *MAP 2012 Workshop* (Mathematics, Algorithms and Proofs), Konstanz, 2012 (Tutorial speaker) • *2013 International Linear Algebra Society (ILAS) Meeting*, June 2013, Providence, RI, USA (Plenary) • *2013 IEEE joint CACSD and SU Symposium*, Hyderabad, India, Août 2013 (Plenary). • *Solving Polynomial Equations* Workshop (October 2014) at the *Simons Institute for the Theory of Computing* of UC Berkeley. (Plenary speaker). • Tri-annual Conference PGMO-COPI'14 (*Conference on Optimisation and Practices in Industry*) (Plenary) <http://www.fondation-hadamard.fr/pgmo-copi-14>. • *Optimization for Machine Learning* Workshop of the *Neural Information Processing Systems Foundation* (NIPS 2014) conference, Montreal, Decembre 2014. (Plenary). • *Hybrid Methodologies for Symbolic-Numeric Computation* (part of ICIAM 2015), Beijing Août 2015. (Plenary) <http://mmrc.iss.ac.cn/HMSNC2015/>. • *International conference on NETWORK Games, COntrol and OPTimization* (NETCOOP), Avignon, November 23–25, 2016 (Plenary). • *Non convex Optimization in Machine Learning* workshop of the *Neural Information Processing Systems Foundation* (NIPS 2016) conference, Barcelona, Décembre 2016. (Keynote) • *SIAM Conference on Control & its Applications* (SIAM CT17), Pittsburgh, July 2017 (Plenary). • *Sums of Squares - Real Algebraic Geometry and its Applications* Conference, Innsbruck, August 2017 (Main Speaker).

3.4 Speaker at invited courses, Winter and Summer schools

- *AMS short course on Optimization* of the 2004 annual meeting of the American Mathematical Society (AMS), Phoenix.
- *Summer School in Optimization* at the

”7th French-Latin American Congress in Applied Mathematics”, Santiago, Chile, 2005. • *Doctorate School on : Optimization over Polynomials and Semidefinite Programming*, University of Klagenfurt (Austria), 2005. • *3ème cycle romand de Recherche Opérationnelle*, Zinal, Switzerland, 2007. • NAPIO 08 summer school (*New Algorithmic Paradigms in Optimization*), ETH Zurich and Ascona, 2008. • *Advanced Course on Optimization: Theory, Methods and Applications* at CRM (Centre de Recerca Matemàtica), Barcelona, 2009. • *VI Escuela de Verano en Matemáticas Discretas*, Valparaiso, Chile, 2011. • *Lunteren Conference on the Mathematics of Operations Research*, Lunteren (Netherlands), January 2011, • Advanced course in the *Metric Geometry, Algorithms and Groups* program of the Henri Poincaré Institute (IHP, Paris), 2011. • The *AMSI 2011 winter school* (of the Australian Mathematical Sciences Institute), Brisbane, 2011. • *Postgraduate Winter School DICOP 2012*, Piura (Peru), 2012. • *4th Summer School on Symbolic Computation (SSSC 2015)*, Beijing, Août 2015. • Invited Course *Positive Polynomials and Optimization* in the **MASTER 2 OPTIMIZATION** of the Paris-Orsay University, March 2016. • Invited speaker at the *2017 Grid Science Winter School & Conference* in Los Alamos, January 2017. • Main speaker at the *Recent advances in Modern optimization* workshop, Naresuan University, Thailand, April 2017. • Invited speaker at the *Tensor Computation* workshop within the **ECM 2017 Conference**, Hong-Kong, 2017.

3.5 Distinguished Speaker in the *High Performance Computing in Engineered Systems* (HPCES) program at MIT, April 2003.

3.6 Speaker at the **MATEMATICKÉ KOLOKVIUM**, Prague, April 2017.
<https://iuuk.mff.cuni.cz/events/colloquia/index.html>

3.7 Associate Editor *SIAM J. Control Optim.* (SICON, 1997–2002) and *SIAM J. Optim.* (SIOPT, 2006–2011), *Int. J. Prod. Res.* (1992–1994), *IEEE Trans. Auto. Control* (1992–1997), *AUTOMATICA* (1998–2002), *Investigación Operativa* (1996–2002), and *Math. Oper. Research* (2014 → present), *SIAM J. Applied Algebra & Geometry* (SIAGA, 2016- present))

3.8 Expertise for NSF (USA), NSERC (Canada), ARC (Australia), ISF (Israel), NWO (Netherlands) and SFI (Science Foundation Ireland).

4. Scientific and Administrative responsibilities

- **2003-2006: Adjoint** to the head of MOCOSY pole at LAAS (44 permanent researchers)
- 1986-1990: Head** of the team “Modélisation Analyse et Conduite des Systèmes de Production” (9 permanents researchers)
- **2013 → 2016: French Delegate** of the **Management Committee**⁶ (MC) of the **ICT COST Action TD1207** *Mathematical Optimization in the Decision Support Systems for*

⁶http://www.cost.eu/domains_actions/ict/Actions/TD1207?management

Efficient and Robust Energy Networks. (COST is a European inter-gouvernemental framework for European cooperation in Science and Technology, which permits to coordinate at the european level several researches funded at national level.)

- **2001-2003: Scientific leader** (France) of a French-British cooperation (British Council, Alliance program) between the Math. Dept. of the University of Liverpool, LAAS-CNRS, Bordeaux University and INRIA-Sophia Antipolis.

- **1985-2009: Scientific leader** (France) of a French-Mexican (CNRS-CONACYT) cooperation between LAAS-CNRS and the Math. Dept. of CINVESTAV-IPN in Mexico.

- **Advisor** of 11 PhD thesis, 4 post-doc, and **Committee member** of 21 Doctorate theses.