Bassam Fayad – Curriculum vitæ   June 10th 2022

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Positions held

- ☐ From August 2020 : Michael and Eugenia Brin Distinguished Chair of Mathematics, University of Maryland.
- ☐ 2019-2020 : Directeur de recherche $1^{\text{ère}}$ classe (Research Director of first class) CNRS, IMJ-PRG, Paris Centre University, Paris, France.
- ☐ 2010-2019 : Directeur de recherche $2^{\text{ème}}$ classe (Research Director of second class) CNRS, IMJ-PRG, Paris Diderot University, Paris, France.
- ☐ 2001-2010 : Chargé de recherche (Research Fellow) CNRS, LAGA, Villetaneuse University, Villetaneuse, France.

Academic

- ☐ Engineering Degree (Master's level) from École Polytechnique, Palaiseau, France, 1995.
- ☐ Master in Urban Planning, École Nationale des ponts et Chaussées, Marne-la-Vallée, 1996.
- ☐ Master in Pure Mathematics from École Polytechnique and Orsay University, France, 1996.
- ☐ PhD in pure mathematics, École Polytechnique, France, 2000. Advisor : Michel Herman.
- ☐ Habilitation to Supervise Researches in Mathematics, University Paris 13, France, 2006.

Distinctions

- ☐ École Polytechnique prize for the best PhD dissertation, 2000.
- ☐ Annales de l'IHP prize, with D. Dolgopyat, 2010.
- ☐ Knut and Alice Wallenbergs grant, fall 2017, KTH, Stockholm.
- ☐ ICM 2018, Invited speaker, Rio De Janeiro.
- ☐ Prime d'encadrement doctoral et de recherche (yearly bonus for directing research, by the CNRS).
- ☐ Knight of the National Order of the Cedar (Lebanon), August 2020.

Teaching and outreach

- ☐ Master thesis : Linyuan Liu (2014), Frank Trujillo (2015), Riwan Kherouf (2016), Hao Wu (2017), Julien Trévisan (2018).
- ☐ PhD students : Mostapha Benhenda (2008–2012), Frank Trujillo (October 2015–), Hao Wu (2017–), Fatna Abdedou (2018–), Julien Trévisan (2018–)
- ☐ Two years undergraduate teaching at Pennsylvania State University, 2001 and 2002.
- ☐ Master courses at the french universities of Paris 6 and Paris 7.
- ☐ Dynamical Systems introductory courses for undergraduate students at the Tsinghua University of Beijing. One or two months classes every year since 2009.
- ☐ Mini-courses in dynamics at several summer or winter schools.
- ☐ Popularization of mathematics
  - — Weekly interventions in second and third grade classes since 2013
  - — Organization and animation of a Mathematics Club at the Collège Couperin in Paris, open for students ranging between Grade 6 and Grade 8.

Academic management

- ☐ Member of the Scientific Committee of the mathematics department of Paris Diderot.
- ☐ Member of the Council of the Institut de Mathématiques de Jussieu Paris Rive Gauche (IMJ-PRG).

- Member of many recruiting committees for academic positions in mathematics at Paris Diderot.
- Director of the Geometry and Dynamics group at the IMJ-PRG.
- Co-organization of the Dynamics Days in Paris. The event takes place on three days every year with 10 to 12 speakers from all branches of dynamical systems and aims at giving a snapshot of the main advances in dynamics at the international level (main yearly dynamics event in France).
- Co-organization of the main weekly seminar in Paris on Dynamical Systems.
- Editor of the Tunisian Journal of Mathematics and of Annales de l'ENS.
- Member of several AnR (research) grants since 2009.

Invited speaker

2001	Workshop on Dynamical Systems at Maryland University, Washington
2001	Colloque International sur la Théorie Ergodique, Villetaneuse
2001	ICTP Conference and Workshop on Dynamical Systems, Trieste, Italie
2002	Research Trimester on Dynamical Systems, Pisa, Italie
2002	Workshop on Dynamical Systems, Maryland, USA
2002	Workshop on Rigidity Theory and Dynamical Systems ETH, Zurich
2002	Mather Fest, PSU-Princeton, USA
2002	Colloque en l'Honneur de Michael Herman, IHP, Paris
2003	Fourth International Conference on Dynamical Systems and Differential Equations, Wilmington, USA
2003	100 years of Kolmogorov, International Congress, Moscow
2003	Dynamische Systeme, Oberwolfach, Allemagne
2003	Equadiff 2003 Hasselt, Belgique
2004	International conference on dynamical systems, Montevideo, Uruguay
2004	From algebraic to topological dynamics, Max Planck institute, Bonn
2004	Summer school and conference on dynamical systems, Trieste, Italie
2004	Recent progress in dynamics, MSRI, Berkeley, USA
2005	International Conference on Dynamical Systems, Warsaw
2005	International Workshop on Global Dynamics Beyond Uniform Hyperbolicity, Chicago
2006	Differentiable Dynamics and Smooth Ergodic Theory, Canadian Winter meeting, Toronto
2006	Dynamical Systems and Number Theory, Pisa
2008	Workshop on Shrinking Target Properties. Cambridge, 2008
2008	Dynamical Systems : Geometric Structures and Rigidity, Bedlewo
2008	IHP, Paris
2009	Systèmes dynamiques et phénomènes aléatoires, IHP Paris
2009	"Dynamische Systeme" au MFO, Oberwolfach
2010	Spectral theory of dynamical systems, Banach Center, Warsaw
2010	Journées Dynamiques, Nice
2011	Dynamical systems and classical mechanics : a conference in celebration of Vladimir Arnold, Eidenburgh

2011	Nanjing Conference on Hamiltonian Dynamics, Nanjing
2011	International Conference on Dynamical Systems, Buzios, Brésil
2012	Dynamique et EDP, CIRM
2012	ICMP 2012, Aalborg, Danemark
2013	"Dynamische Systeme" au MFO, Oberwolfach
2014	Summer School on Dynamical Systems, Maryland
2014	Ergodic Theory and Dynamical Systems - Torun
2014	Dynamics and PDEs Conférence, Cargèse
2014	Semi-annual Workshop in Dynamical Systems and Related Topics, PennState, USA
2015	Hamiltonian systems and their applications, Saint Petersburg
2015	School and Conference on Dynamical Systems, Trieste
2016	International Conference on Dynamical Systems, Buzios
2016	JISD2016 : 14th Workshop on interactions between dynamical systems and partial differential equations, Barcelone.
2016	Géométrie ergodique, une conférence en l'honneur de François Ledrappier, Paris
2016	Workshop in Dynamical Systems, KTH, Stockholm
2016	97éme rencontre entre mathématiciens et physiciens théoriciens : Autour de Poincaré, Strasbourg
2016	International Conference *Anosov Systems and Modern Dynamics* dedicated to the 80th anniversary of Dmitry Anosov, Moscow
2016	Course in the Winter School on conservative dynamics, ETH, Engelberg.
2017	Conference on Hamiltonian Systems. In tribute to the memory of John Mather. ETH, Ascona
2017	A conference in memory of Jean-Christophe Yoccoz
2018	Workshop on quasi-periodic dynamics and Schrödinger operators, Nanjing
2018	Dynamical systems and related topics, ICM satellite meeting, Salvador de Bahia
2018	ICM, Rio
2018	Perspectives in Hamiltonian dynamics, Venice
2018	New Methods for Zimmer's Conjectures, IPAM, UCLA
2018	2018 Workshop in Dynamical Systems and Related Topics, in Memory of Anatole Katok, Penn State University
2018	Colloquium talk at Maryland University
2018	Surface dynamics workshop, Montevideo
2019	London analysis and probability seminar, UK
2019	Dynamics of Parabolic Flows, Recent advances and new perspectives , Zurich, July 2019
2019	France Brazil first joint meeting in mathematics, Rio De Janeiro July 2019
2019	CAMS 2020, Twenty years in the life of a center, AUB Beirut, November 2019
2019	2020 Vision for Dynamics, Scientific Committee member, Bedlewo, August 2019
2020	2020 Workshop in Dynamical Systems and Related Topics, November 2020 (online, PSU)
2021	Hyperbolic Dynamics and Structural Stability, Dedicated to the 85th Anniversary of D. V. Anosov, November, 2021 (online, Moscow)

2021	Workshop in Dynamical Systems and Related Topics, October 2021, PSU
2022	Flexibility and rigidity in dynamical systems, March 2022, Stony Brook

Research and teaching stays

2001	Scuola Normale Superiore di Pisa
2001	PennState, State College, USA
2003	American University of Beirut, Beyrouth
2003	Insitute of Mathematics of the Polish Academy of Sciences, Warsaw
2003	Scuola Normale Superiore di Pisa
2004	PennState, State College, USA
2004	Banach Center, Warsaw
2006	Toronto University, Canada
2006	Scuola Normale Superiore di Pisa
2006	Toronto University, Canada
2007	Bristol University, Royaume-Uni
2009	Tsinghua, Beijing
2010	Centro Ennio de Giorgi, Pisa
2010	Mittag Lefller, Suède
2010	IMPA, Rio de Janeiro, 2010
2010	Tsinghua, Beijing
2011	Fields Institute, Toronto
2011	KTH, Stockholm
2012	Laboratoire Poncelet, Moscow
2013	Nanjing University, Nanjing
2013	IMPA, Rio de Janeiro 2013
2013	KTH, Stockholm, 2013
2014	Tsinghua, Beijing
2014	University of Maryland, Maryland
2014	University of Torun, Torun
2015	Tsinghua, Beijing
2015	March to Novemebr 2015 : Laboratoire Fibonacci, Pisa
2016	May 2016 : Tsinghua, Beijing
2016	14 to 21 April 2016 : Yeshiva University, New York
2017	May and June 2017 : Tsinghua, Beijing
2017	September and Novemebr 2017 : KTH, Stockholm
2018	Maryland January 2018
2018	KTH, Stockholm, February 2018
2018	Tsinghua Beijing, May 2018
2019	KTH, Stockholm, February 2019
2019	Tsinghua Beijing, April and May 2019

2019   5th Brazilian School on Dynamical Systems, course lecturer, Belo Horizonte, October 2019

Publications

Topologically mixing and minimal but not ergodic, analytic transformation on $\mathbb{T}^5$,
Bol. Soc. Brasil. Mat. (N.S.) volume 31 (2000), no. 3, 277–285.

Polynomial decay of correlations for a class of smooth flows on the two torus,
Bull. Soc. Math. France, tome 129 (2001), no. 4, 487–503.

Partially mixing and locally rank 1 smooth transformations and flows on the torus $\mathbb{T}^d, d \geq 3$,
J. London Math. Soc., volume **64**, (2001), p. 637–654.

Mixed spectrum reparametrizations of linear flows on $\mathbb{T}^2$, (with Katok and Windsor)
Moscow Mathematical Journal, volume **1**, (2001), p. 521–537.

Weak mixing for reparametrized linear flows on the torus,
Ergodic Theory and Dynamical Systems, volume **22**, (2002), p. 187–201.

Analytic mixing reparametrizations of irrational flows on the torus $\mathbb{T}^n$, $n \geq 3$,
Ergodic Theory and Dynamical Systems, (23) 2002. p. 437–468.

Skew products over translations on $\mathbb{T}^d, d \geq 2$,
Proc. Amer. Math. Soc., volume 130 (2002), no. 1, 103–109.

Topologically mixing flows with pure point spectrum,
Pubblicazioni della Classe di Scienze, Scuola Normale Superiore, Pisa.

Constructions in elliptic dynamics, (with A. Katok)
Ergodic Theory Dynamical Systems, volume Dedicated to the memory of M. Herman, **24**, (2004), p. 1477–1520.

Nonuniform hyperbolicity and elliptic dynamics,
in **Modern Dynamical Systems and Applications**, edité par M. Brin, B. Hasselblatt, Y. Pesin, (2004) Cambridge, p. 325–330.

Rank one and mixing differentiable flows,
Inventiones Mathematicae, 160 (2005), no. 2, p. 305–340.

Weak mixing disc and annulus diffeomorphisms with arbitrary Liouvillean rotation number on the boundary, (with M. Saprykina)
Ann. Sci. École Norm. Sup. (4) 38 (2005), no. 3, 339–364.

Smooth mixing diffeomorphisms and flows with singular spectra,
Duke Math. J. Volume 132, Number 2 (2006), 371-391.

Mixing in the absence of the Shrinking Target Property,
Bull. of the London Math. Soc. 38 (2006), p. 829–838.

Dichotomies between hyperbolicity and zero Lyapunov exponents for SL(2, $\mathbb{R}$)-cocycles, (with J. Bochi),
Bull. of the Braz. Math. Soc. 37, no. 3 (2006), 307-349.

A remark on conservative diffeomorphisms, (with J. Bochi and E. Pujals),
Comptes Rendus Acad. Sci. Paris Ser. I 342 (2006), 763–766.

On the ergodicity of the Weyl sums cocycle,
Acta Arithmetica 125 (2006), p. 305–316.

On the ergodicity of cylindrical transformations given by the logarithm, (with M. Lemańczyk),
Moscow Math. J. Volume **6** (2006), Number 4, p. 657–672.

A Dichotomy between discrete and continuous spectrum for a class of special flows over rotations, (with A. Windsor),
Journal of Modern Dynamics 1 (2007), no. 1, 107–122.

Nonstandard smooth realizations of any Liouvillean rotation of the circle, (with M. Saprykina and A. Windsor),
Erg. Th. and Dyn. Sys. Volume **27** Issue 06 (2007), p. 1803–1818.

On exponential growth of products of matrices in SL(2, ℝ), (with R. Krikorian),
Nonlinearity 319-323 (2008).

Continuous spectrum on laminations over Aubry-Mather sets,
Disc. and Cont. Dyn. Sys. Volume **21**, Issue 3, (2008), p. 823-834.

Smooth linearization of commuting circle dieomorphisms, (with K. Khanin),
Annals of Mathematics 170 (2009), 961–980.

Herman's last geometric theorem, (with R. Krikorian),
Ann. Sci. Ecole Norm. Sup. 42 (2009), 193–219.

Rigidity results for SL(2, ℝ)-cocycles, (with R. Krikorian),
Journal of Modern Dynamics (2009), Vol 3, p. 479–510.

Unbounded orbits for semi-circular outer billiard, (with D. Dolgopyat),
Annales Henri Poincaré Volume **10**, Issue 2, (2009) p. 357–375.

A KAM scheme for SL(2, ℝ)-cocycles with Liouvillean frequencies, (with A. Avìla and R. Krikorian),
Geometric and Functional Analysis Volume **21**, Issue 5, (2011), p. 1001–1019

KAM-tori near an analytic elliptic fixed point, (with H. Eliasson and R. Krikorian),
Regular and Chaotic Dynamics 18 (2013) p. 801–831.

Deviations of Ergodic sums for Toral Translations I. Convex bodies, (with D. Dolgopyat),
Geometric and Functional Analysis 24, (2014) p. 85–115.

Analytic uniquely ergodic volume preserving maps on odd spheres, (with A. Katok),
Commentarii Mathematici Helvetici 89 (2014), no. 4, 963–977.

On the convergence to 0 of $m_n \xi[1]$, (with J.-P. Thouvenot),
Acta Arithmetica 165 (2014), no. 4, 327–332.

On manifolds supporting distributionally uniquely ergodic diffeomorphisms, (with A. Avìla and A. Kocsard),
J. Differential Geometry Volume 99, Number 2 (2015), 191-213.

Limit Theorems for toral translations, (with D. Dolgopyat),
Proceedings of Symposia in Pure Mathematics Volume 89, 2015.

On the stability of KAM tori, (with H. Eliasson and R. Krikorian),
Duke Mathematical Journal 164 (2015), no. 9, 1733–1775.

On rigidity times for weakly mixing systems that are not rigidity times for any irrational rotation, (with A. Kanigowski),
Ergodic Theory and Dynamical Systems. 35, Issue 08, (2015), pp. 2529–2534.

Multiple mixing for a class of conservative surface flows, (with A. Kanigowski),
Inventiones Math., **203**, (2016) p. 555–614.

KAM-instability of elliptic fixed points in arbitrary frequency, (with M. Saprykina),
AMS Contemporary Mathematics 692, Modern Theory of Dynamical Systems : A Tribute to Dmitry Victorovich Anosov. Editors : A. Katok,Y. Pesin,F. R. Hertz, 2017.

Double exponential stability of quasi-periodic motion in Hamiltonian systems, (with A. Bounemoura and L. Niedermann),
CMP 350, (2017) p. 361–386.

Central limit theorems for simultaneous Diophantine approximations, (with D. Dolgopyat and I. Vinogradov),
Journal de l'École Polytechnique Vol. 4 (2017), p. 1–35.

An effective version of Katok's horseshoe theorem for conservative C^2 surface diffeomorphisms, (with Z. Zhang),
Journal of Modern Dynamics, Volume 11, (2017), p. 425–445.

Double exponential stability of quasi-periodic motion in Hamiltonian systems, (with A. Bounemoura and L. Niedermann),
CMP 350, (2017) p. 361–386.

On local rigidity of partially hyperbolic affine $\mathbb{Z}^k$ actions, (with D. Damjianovic),
J. reine angew. Math. Volume 751, p. 1–26, (2019).

Continuous spectrum for mixing Schrödinger operators, (withY. Qu),
Ergodic Theory and Dynamical Systems, Volume 39, (2019), p. 357–369.

Nekhoroshev estimates for steep real-analytic elliptic equilibrium points, (with A. Bounemoura, L. Niedermann)
Nonlinearity, vol. 33 (2019), p. 1-33.

Attracted by an elliptic fixed point, (with Jean-Pierre Marco and David Sauzin)
Astérisque, numéro spécial à la mémoire de J.-C. Yoccoz, Tome 416 (2020).

KAM tori are no more than sticky, (with D. Sauzin)
Archive for Rational Mechanics and Analysis, Volume 57, (2020), p. 1177–1211.

On mixing diffeomorphisms of the disc, (with A. Avìla, , P. Le Calvez, Z. Zhan, D. Xu)
Inventiones mathematicae volume 220, p. 673-714 (2020).

Super-exponential stability for generic real-analytic elliptic equilibrium points, (withA. Bounemoura et L. Niedermann)
Advances in Math., Volume 366 (2020).

Deviations of Ergodic sums for Toral Translations II. Squares, (withD. Dolgopyat)
Publ. Math. Inst. Hautes Études Sci., Volume 132, (2020), p. 293-352.

Erratic behavior for 1-dimensional random walks in a Liouville quasi-periodic environment, (with D. Dolgopyat and M. Saprykina)
Electronic Journal of Probability, 26 : (2021), p. 1-36. DOI : 10.1214/21-EJP622

Lebesgue spectrum of countable multiplicity for conservative flows on the torus, (with Giovanni Forni and Adam Kanigowski)
J. Amer. Math. Soc., 34 (2021), p. 747-813.

Intertemporal price discrimination with time-varying valuations, (with V. Araman)
Oper. Res. 69 (2021), no. 1, p. 245-265.

Topological weak mixing and diffusion at all times for a class of Hamiltonian systems, (with Maria Saprykina)
Ergodic Theory and Dynamical Systems, 42(2), (2022), p. 777-791.

Non-differentiable irrational curves for twist maps, (with A. Avila)
Ergodic Theory and Dynamical Systems, 42(2), (2022), p. 491-499.

Lyapunov unstable elliptic equilibria
J. Amer. Math. Soc., 36 (2023), no. 1, p. 81-106.

Realizing arbitrary d-dimensional dynamics by renormalization of C^d-perturbations of identity, with Maria Saprykina
Discrete Contin. Dyn. Syst., Vol. 42, no. 2, (2022), p. 597-607.

Multiple Borel-Cantelli lemma in dynamics and multilog law for recurrence, with Dolgopyat, Dmitry and Sixu Liu
J. Mod. Dyn. 18 (2022), p. 209-289.

Instabilities of invariant quasi-periodic tori, (withG. Farré)
J. Eur. Math. Soc. 24 (2022), no. 12, p. 4363-4383.

Expository

Jean-Christophe Yoccoz and the theory of circle diffeomorphisms, (with H. Eliasson and R. Krikorian)
La Gazette des Mathématiciens, april 2018.

Some questions around quasi-periodic dynamics, (withR. Krikorian)
Proceedings of the ICM 2018, arXiv :1809.10375

Quasi-periodic dynamics : Introduction to KAM theory and Liouville constructions.

The collected works of Anatole Katok, World Scientific 2023. Edited By : Svetlana Katok, Bassam Fayad, Giovanni Forni, Boris Hasselblatt, Mariusz Lema ?czyk, Yakov Pesin, Federico Rodriguez Hertz, and Ralf Spatzier.
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