

Jean-Baptiste Fouvry

Nationality: French

Date of Birth: March 16th, 1991

Institut d'Astrophysique de Paris

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EDUCATION & TRAINING

- 2022 **Habilitation à diriger les recherches**, Sorbonne Université
Stellar Dynamics in Galactic Nuclei
- 2019 – present **CNRS**, Chargé de recherche
Institut d'Astrophysique de Paris
- 2016 – 2019 **NASA Hubble Fellow**
Member, **Institute for Advanced Study**, Princeton
- 2013 – 2016 Ph.D. at the **Institut d'Astrophysique de Paris**
Secular evolution of self-gravitating systems over cosmic age
Advisors: Christophe Pichon (IAP, Paris) and James Binney (Oxford)
- 2012 – 2013 First-year student in the **Corps des Mines**
Attached to the French Ministry of Economy, Industry and Employment
- 2009 – 2012 Master at the **Ecole Polytechnique**
French national engineering school, 4-years master program

PUBLICATIONS

- [42] *Kinetic Theory of Stellar Systems: A Tutorial*,
Hamilton, C., **Fouvry, J.-B.**, Pichon, C., Phys. Plasmas, submitted
- [41] *Non-resonant relaxation of rotating globular clusters*,
Tep, K., **Fouvry, J.-B.**, Pichon, C., A&A, submitted
- [40] *Dynamical large deviations for long-range interacting inhomogeneous systems without collective effects*,
Feliachi, O., **Fouvry, J.-B.**, Phys. Rev. E, submitted
- [39] *Predicting the linear response of self-gravitating stellar spheres and discs with LinearResponse.jl*,
Petersen, M., Roule, M., **Fouvry, J.-B.**, Pichon, C., Tep, K., MNRAS, in press
- [38] *Kinetic blockings in long-range interacting systems*,
Fouvry, J.-B., Roule, M., 2023, Phys. Rev. E, 108, 054108
- [37] *Constraining intermediate-mass black holes from the stellar disc of SgrA**,
Fouvry, J.-B., Bustamante-Rosell, M. J., Zimmerman, A., 2023, MNRAS, 526,1471
- [36] *Milankovitch equations with spinors*,
Deme, Barnabás, **Fouvry, J.-B.**, 2023, Celest. Mech. Dyn. Astron., 135, 47
- [35] *Astrophysics with the Laser Interferometer Space Antenna*,
LISA Collaboration including **Fouvry, J.-B.**, 2023, Living Rev. Relativ., 26, 2
- [34] *Kinetic theory of one-dimensional inhomogeneous long-range interacting N-body systems at order $1/N^2$ without collective effects*,
Fouvry, J.-B., 2022, Phys. Rev. E, 106, 054123

- [33] *Long-term relaxation of 1D self-gravitating systems*,
Roule, M., **Fouvry, J.-B.**, Pichon., C., Chavanis, P.-H., 2022, Phys. Rev. E, 106, 044118
- [32] *Orbital alignment and mass segregation in galactic nuclei via vector resonant relaxation*,
Magnan, N., **Fouvry, J.-B.**, Pichon., C., Chavanis, P.-H., 2022, MNRAS, 514, 3452
- [31] *Non-resonant relaxation of anisotropic globular clusters*,
Tep, K., **Fouvry, J.-B.**, Pichon., C., 2022, MNRAS, 514, 875
- [30] *Linear response theory and damped modes of stellar clusters*,
Fouvry, J.-B., Prunet, S., 2022, MNRAS, 509, 2443
- [29] *Secular Dynamics around a Supermassive Black Hole via Multipole Expansion*,
Fouvry, J.-B., Dehnen, W., Tremaine, S., Bar-Or, B., 2022, ApJ, 931, 8
- [28] *Mapping the Galactic centre's dark cluster via Resonant Relaxation*,
Tep, K., **Fouvry, J.-B.**, Pichon, C., Heißel, G., Paumard, T., Perrin, G., Vincent, F., 2021, MNRAS, 506, 4289
- [27] *Resonant and non-resonant relaxation of globular clusters*,
Fouvry, J.-B., Hamilton, C., Rozier, S., Pichon, C., 2021, MNRAS, 508, 2210
- [26] *Relaxation in a Fuzzy Dark Matter Halo. II. Self-consistent kinetic equations*,
Bar-Or, B., **Fouvry, J.-B.**, Tremaine, S., 2021, ApJ, 915, 27
- [25] *Kinetic theory of one-dimensional homogeneous long-range interacting systems with an arbitrary potential of interaction*,
Fouvry, J.-B., Chavanis, P.-H., Pichon, C., 2020, Phys. Rev. E, 102, 052110
- [24] *Young stellar cluster dilution near supermassive black holes: the impact of Vector Resonant Relaxation on neighbour separation*,
Giral Martínez, J., **Fouvry, J.-B.**, Pichon, C., 2020, MNRAS, 499, 2714
- [23] *The Strength of the Dynamical Spiral Perturbation in the Galactic Disk*,
Eilers, A.-C., Hogg, D., Rix, H.-W., Frankel, N., Hunt, J., **Fouvry, J.-B.**, Buck, T., 2020, ApJ, 900, 186
- [22] *Kinetic theory of 1D homogeneous long-range interacting systems sourced by $1/N^2$ effects*,
Fouvry, J.-B., Bar-Or, B., Chavanis, P.-H., 2019, Phys. Rev. E, 100, 052142
- [21] *Vector Resonant Relaxation of Stars around a Massive Black Hole*,
Fouvry, J.-B., Bar-Or, B., Chavanis, P.-H., 2019, ApJ, 883, 161
- [20] *Mapping the stability of stellar rotating spheres via linear response theory*,
Rozier, S., **Fouvry, J.-B.**, Breen, P. G., Varri, A. L., Pichon, C., Heggie, D. C., 2019, MNRAS, 487, 711
- [19] *Instabilities in disc galaxies: from noise to grooves to spirals*,
De Rijcke, S., **Fouvry, J.-B.**, Pichon, C., 2019, MNRAS, 484, 3198
- [18] *Secular dynamics of long-range interacting particles on a sphere in the axisymmetric limit*,
Fouvry, J.-B., Bar-Or, B., Chavanis, P.-H., 2019, Phys. Rev. E, 99, 032101
- [17] *How gravitational softening affects galaxy stability. I. Linear mode analysis of disc galaxies*,
De Rijcke, S., **Fouvry, J.-B.**, Dehnen, W., 2019, MNRAS, 485, 150
- [16] *Relaxation in a Fuzzy Dark Matter Halo*,
Bar-Or, B., **Fouvry, J.-B.**, Tremaine, S., 2019, ApJ, 871, 28
- [15] *Relaxation in self-gravitating systems*,
Fouvry, J.-B., Bar-Or, B., 2018, MNRAS, 481, 4566
- [14] *Revisiting relaxation in globular clusters*,
Hamilton, C., **Fouvry, J.-B.**, Binney, J., Pichon, C., 2018, MNRAS, 481, 2041
- [13] *Scalar Resonant Relaxation of Stars around a Massive Black Hole*,
Bar-Or, B., **Fouvry, J.-B.**, 2018, ApJ, 860, 23
- [12] *The secular evolution of discrete quasi-Keplerian systems. II. Application to a multi-mass axisymmetric disc around a supermassive black hole*,
Fouvry, J.-B., Pichon, C., Chavanis, P.-H., 2017, A&A, 609, A38

- [11] *Distribution functions for resonantly trapped orbits in the Galactic disc*,
Monari, G., Famaey, B., **Fouvry, J.-B.**, Binney, J., 2017, MNRAS, 471, 4314
- [10] *Resonant thickening of self-gravitating discs: imposed or self-induced orbital diffusion in the tightly wound limit*,
Fouvry, J.-B., Pichon, C., Chavanis, P.-H., Monk, L., 2017, MNRAS, 471, 2642
- [9] *Dressed diffusion and friction coefficients in inhomogeneous multi-component self-gravitating systems*,
Heyvaerts, J., **Fouvry, J.-B.**, Chavanis, P.-H., Pichon, C., 2017, MNRAS, 469, 4193
- [8] *The secular evolution of discrete quasi-Keplerian systems. I. Kinetic theory of stellar clusters near black holes*,
Fouvry, J.-B., Pichon, C., Magorrian, J., 2016, A&A, 598, A71
- [7] *Functional integral derivation of the kinetic equation of two-dimensional point vortices*,
Fouvry, J.-B., Chavanis, P.-H., Pichon, C., 2016, Phys. Lett. A, 380, 2589
- [6] *Functional integral approach to the kinetic theory of inhomogeneous systems*,
Fouvry, J.-B., Chavanis, P.-H., Pichon, C., 2016, Physica A, 459, 117
- [5] *Secular diffusion in discrete self-gravitating tepid discs. II. Accounting for swing amplification via the matrix method*,
Fouvry, J.-B., Pichon, C., Magorrian, J., Chavanis, P.-H., 2015, A&A, 584, A129
- [4] *Secular diffusion in discrete self-gravitating tepid discs. I. Analytic solution in the tightly wound limit*,
Fouvry, J.-B., Pichon, C., Chavanis, P.-H., 2015, A&A, 581, A139
- [3] *Self-gravity, Resonances, and Orbital Diffusion in Stellar Disks*,
Fouvry, J.-B., Binney, J., Pichon, C., 2015, ApJ, 806, 117
- [2] *Secular resonant dressed orbital diffusion - II. Application to an isolated self-similar tepid galactic disc*,
Fouvry, J.-B., Pichon, C., 2015, MNRAS, 449, 1982
- [1] *Secular resonant dressed orbital diffusion - I. Method and WKB limit for tepid discs*,
Fouvry, J.-B., Pichon, C., Prunet, S., 2015, MNRAS, 449, 1967

AWARDS

2017	Prize Aguirre-Basualdo , Chancellerie des Universités de Paris
2017	Mention Prize Daniel Guinier , Société Française de Physique
2017	Ph.D. Prize 2017 , Société Française d'Astronomie & d'Astrophysique
2017	Outstanding Thesis Award , Springer Verlag
2007	Shared First Prize , Concours Général de Physique

GRANTS

2024	Grant <i>PNCG</i> , IAP – PI – 3,000€
2020 – 2023	Grant <i>ANR Tremplin</i> , IAP – PI – 120,000€
2020 – 2021	Grant <i>Initiative Physique des Infinis</i> , Sorbonne Université – PI – 60,000€
2020	Grant <i>PNCG</i> , IAP – PI – 3,000€
2016	NASA Hubble Fellowship – PI – \$250,000
2016	Grant <i>PNCG</i> , IAP – PI – 3,000€
2015 – 2016	Grant <i>Défi Inphyniti CNRS</i> , IAP – Toulouse – PI – 2×5,000€
2015	Grant <i>Institut Lagrange de Paris</i> – PI – 5,000€
2014	Grant <i>GREAT program</i> , Oxford – PI – 5,000€
2014	Grant <i>Oxford-CNRS Collaboration Scheme</i> , Oxford – PI – 5,000€

RESPONSIBILITIES

2024	“Interconnections between the Physics of Plasmas and Self-gravitating Systems” KITP program; main organizer
2023 – 2024	Weekly Astrophysics Colloquium IAP; main organizer
2023	Univ. Edinburgh Workshop “Secular evolution of self-gravitating systems” ; main organizer
2019 – 2021	“Kinetic Theory of Self-Gravitating Systems” ; M2 teaching in Oxford
11/2017	IAS Workshop “Stellar Dynamics in Galactic Nuclei” ; main organizer
2017 – 2018	Weekly Astrophysics Colloquium, IAS - Princeton; main organizer
05/2016	IAP Workshop “Secular Evolution of Self-Gravitating Systems over Cosmic Age” ; main organizer
2015 – present	Referee: MNRAS, ApJ, A&A, New. Astron., JPP, Phys. Rev. D, Universe, J. Stat. Phys., Entropy, EPJP

RESEARCH SUPERVISION

Postdocs

2022 – 2024	B. Deme, <i>Dynamics of quasi-Keplerian systems</i>
2021 – 2022	M. Petersen, <i>Linear response of stellar systems</i>

PhD students

2023 – 2026	S. Flores Morales, <i>Stellar dynamics in galactic nuclei</i>
2021 – 2024	M. Roule (with C. Pichon), <i>Kinetic theory of self-gravitating systems</i>
2020 – 2023	K. Tep (with C. Pichon), <i>Relaxation of anisotropic stellar clusters</i>
2017 – 2020	S. Rozier (with C. Pichon), <i>Linear stability of rotating stellar clusters</i>

MSc students

2024	A. El Rhirhayi, <i>Balescu–Lenard equation close to marginal stability</i>
2023	S. Flores Morales, <i>Direct interaction approximation in galactic nuclei</i>
2022	P. Bartoli, <i>Resonant relaxation in harmonic cores</i>
2021	N. Magnan, <i>Thermodynamics of orbital orientations in galactic nuclei</i>
2021	M. Roule, <i>Long-term relaxation of 1D self-gravitating systems</i>
2020	K. Tep, <i>Scalar resonant relaxation around SgrA*</i>
2020	J. Giral Martínez, <i>Vector resonant relaxation and neighbor separation</i>
2017	C. Hamilton, <i>Resonant relaxation of globular clusters</i>

BSc students

2015	L. Monk, <i>Spontaneous thickening of galactic discs</i>
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SCIENTIFIC PRESENTATIONS

01/2024	SEGAL Meeting, Nice
12/2023	Gravity2023 Conference, Porto
10/2023	Théorie Univers Gravitation Meeting, ENS, Paris
07/2023	Vlasov conference, CIRM, Marseille
06/2023	Astronomy night, IAP, Paris
06/2023	Weekly seminar, IPhT CEA, Saclay
04/2023	Astrophysics seminar, Royal Obs., Edinburgh
01/2023	IMCCE Seminar, Obs. Paris, Paris

12/2022 SEGAL Meeting, IAP, Paris
07/2022 Plasma Kinetics Meeting, WPI, Vienna
07/2022 Stellar Dynamics seminar, Vienna University
05/2022 Theoretical Physics seminar, Oxford
03/2022 SEGAL Meeting, IAP, Paris
10/2021 SEGAL Meeting, IAP, Paris
05/2021 ICAP Meeting, Sorbonne Université, Paris
05/2021 IPI Meeting, Sorbonne Université, Paris
07/2020 Astro Lunch, Hebrew Univ., Jerusalem
06/2020 Astronomy Night, IAP, Paris
06/2020 Astrophysics seminar, Obs. Strasbourg
01/2020 Theoretical Physics seminar, Obs. Meudon
11/2019 Theoretical Physics seminar, Oxford
11/2019 Astrophysics seminar, IAP, Paris
09/2019 Theoretical Physics seminar, ENS Lyon
07/2019 Vlasovia conference, Strasbourg
06/2019 EWASS annual meeting, Lyon
06/2019 Galaxy group meeting, MPIA, Heidelberg
06/2019 Weekly seminar, Eötvös University, Budapest
05/2019 Weekly seminar, DAMTP, Cambridge
05/2019 Theoretical Physics seminar, Oxford
05/2019 News from the Dark Workshop, Montpellier
10/2018 IAS - Princeton Postdoc Symposium, Princeton
03/2018 Hubble Fellows Symposium, STScI, Baltimore
10/2017 Weekly seminar, IRAP, Toulouse
10/2017 Vlasov conference, CIRM, Marseille
10/2017 Weekly seminar, Laboratoire J. A. Dieudonné, Nice
10/2017 Princeton University Lunch Talk, Princeton
07/2017 SF2A Meeting, Obs. Paris
03/2017 Informal Astrophysics seminar, IAS, Princeton
03/2017 Hubble Fellows Symposium, STScI, Baltimore
02/2017 Weekly seminar, LPT, Toulouse
09/2016 Weekly seminar, Obs. Strasbourg
06/2016 Master Class, Lindau Nobel Laureates Meeting
06/2016 Weekly seminar, IPhT CEA, Saclay
05/2016 Workshop Secular Evolution, IAP, Paris
02/2016 Astrophysics meeting, KIAS, Korea
02/2016 Galaxy evolution meeting, Yonsei University, Korea
01/2016 Cosmology seminar, MPA, Garching
10/2015 GRECO seminar, IAP, Paris
06/2015 ANR Spine Spring meeting, Cambridge
05/2015 Weekly seminar, LPT, Toulouse
05/2015 Journal-Club Large Structures, IAP, Paris
01/2015 Kavli Institute for Cosmology, Cambridge
11/2014 Conference in memory of Jean Heyvaerts, IAP, Paris
07/2014 ANR Spine Kickoff meeting, Porquerolles
07/2014 Workshop on collisionless fluids, ILP, Paris