

Kotaro Fujisawa

Curriculum Vitae

9 May 2023

Personal data

Nationality: Japanese

Date of Birth: 17 May 1985

Gender: Male

Marital Status: Married

Research Interests: Astrophysics (rotating star, magnetar, massive star, brown dwarf) & Computational Science (nonlinear system of equations, quantum computing)

Education

Apr.2011 **Ph.D.**, *Department of Earth Science and Astronomy, College of Arts and Sciences, University of Tokyo*, "Studies of equilibrium states with & magnetic field and meridional flow in astrophysics".

Supervisor : Professor Yoshiharu Eriguchi

Apr.2009 **Masters of Arts and Science**, *Department of Earth Science and Astronomy, College of Arts and Sciences, University of Tokyo*, Graduate Student.

Supervisor : Professor Yoshiharu Eriguchi

Apr.2005 **Bachelor of Arts and Science**, *Department of Earth Science and Astronomy, College of Arts and Sciences, University of Tokyo*, Undergraduate Student.

Professions

Teaching Experience

Apr.2022 **Computational Physics Exercises**, *Department of Physics, University of Tokyo*.
–Mar.2023

Apr.2020 **Part-time Lecturer (Physics)**, *Physics Department, Chiba Institute of Technology*.
–Mar.2022

Apr.2015 **Part-time Lecturer (Physics)**, *Physics Department, Chiba Institute of Technology*.
–Sep.2016

Apr.2015 **Part-time Lecturer (Astronomy)**, *College of Arts and Sciences, University of Tokyo*.
–Sep.2015

Apr.2009 **Teaching Assistant (Mathematics and Physics)**, *College of Arts and Sciences, University of Tokyo*.
–Mar.2013

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Professional Societies

Apr.2014 **Physical Society of Japan.**
-Present

Jan.2013 **Rironkon (organized of theoretical astrophysicist of Japan).**
-Present

Apr.2009 **Astronomical Society of Japan.**
-Present

Referee

Europhysics Letters, The Astrophysical Journal, The Astrophysical Journal Supplement Series, Communications in Computational Physics, Astronomy & Astrophysics, European Physical Journal C

Languages

Japanese **Native**

English **Intermediate**

Spanish **Basic**

Basic words and phrases only

Hobbies

- Playing Music

- Euhonium, Baritone Horn & Flute

Publications

- 28. Kōji Uryū, Shijun Yoshida, Eric Gourgoulhon, Charalampos Markakis, **Kotaro Fujisawa**, Antonios Tsokaros, Keisuke Taniguchi, Mina Zamani
“Equilibriums of extremely magnetized compact stars with force-free magnetotunnels”
Physical Review D, in press, (2023)
- 27. Yasufumi Kojima, Shota Kisaka, **Kotaro Fujisawa**,
“Evolutionary deformation toward the elastic limit by a magnetic field confined in the neutron star crust”
The Astrophysical Journal, 946, 75, (2023)
- 26. Misa Ogata, Hirotada Okawa, **Kotaro Fujisawa**, Nobutoshi Yasutake, Yu Yamamoto, Shoichi Yamada
“A Lagrangian construction of rotating star models”
Monthly Notices of the Royal Astronomical Society, 521(2), 2561–2576, (2023)
- 25. Hirotada Okawa, **Kotaro Fujisawa**, Nobutoshi Yasutake, Misa Ogata, Yu Yamamoto, Shoichi Yamada
“A novel Lagrangian formulation to construct relativistic rotating stars: towards its application to their evolution calculations”
Monthly Notices of the Royal Astronomical Society, 520(1), 20–43, (2023)
520(1) 24-43 2023
- 24. **Kotaro Fujisawa**, Yasufumi Kojima, Shota Kisaka
“Strong toroidal magnetic fields sustained by the elastic crust in a neutron star”
Monthly Notices of the Royal Astronomical Society, 519(3), 3776–3784, (2023)
- 23. Hirotada Okawa, **Kotaro Fujisawa**, Yu Yamamoto, Ryosuke Hirai, Nobutoshi Yasutake, Hiroki Nagakura, Shoichi Yamada
“The W4 method: A new multi-dimensional root-finding scheme for nonlinear systems of equations”
Applied Numerical Mathematics, 183 157–172, (2023)
- 22. Yasushi Suto, Shin Sasaki, Masataka Aizawa, **Kotaro Fujisawa**, Kazumi Kashiyama
“Modeling photometric variations due to a global inhomogeneity on an obliquely rotating star: Application to light curves of white dwarfs”
Publications of the Astronomical Society of Japan, 75(1) 103–119, (2022)
- 21. Takatoshi Ko, **Kotaro Fujisawa**, Toshikazu Shigeyama
“Self-similar Solution of Rotating Eruptive Outflows on Its Equatorial Plane ”
The Astrophysical Journal 941(1) 38 (2022)
- 20. **Kotaro Fujisawa**, Kisaka Shota, Yasufumi Kojima
“Magnetically confined mountains on accreting neutron stars with multipole magnetic fields”
Monthly Notices of the Royal Astronomical Society, 516, 5196–5208, (2022)

- 19. Masataka Aizawa, Kojiro Kawana, Kazumi Kashiyama, Ryou Ohsawa, Hajime Kawahara, Fumihiro Naokawa, Tomoyuki Tajiri, Noriaki Arima, Hanchun Jiang, Tilman Hartwig, **Kotaro Fujisawa**, Toshikazu Shigeyama, Ko Arimatsu, Mamoru Doi, Toshihiro Kasuga, Naoto Kobayashi, Sohei Kondo, Yuki Mori, Shin-ichiro Okumura, Satoshi Takita, Shigeyuki Sako
“Fast optical flares from M dwarfs detected by a one-second-cadence survey with Tomo-e Gozen”
Publications of the Astronomical Society of Japan, 74(5) 1069–1094 (2022)
- 18. Yasufumi Kojima, Shota Kisaka, **Kotaro Fujisawa**
“Magnetic field sustained by the elastic force in neutron star crusts”
Monthly Notices of the Royal Astronomical Society, 551, 480–487 (2022)
- 17. Yasufumi Kojima, Shota Kisaka, **Kotaro Fujisawa**
“Magneto-elastic equilibrium of a neutron star crust”
Monthly Notices of the Royal Astronomical Society, 506, 3936–3945 (2021)
- 16. Yasufumi Kojima, Shota Kisaka, **Kotaro Fujisawa**
“Evolution of magnetic deformation in neutron star crust”
Monthly Notices of the Royal Astronomical Society, 502, 2097–2104 (2021)
- 15. Kōji Uryū, Shijun Yoshida, Eric Gourgoulhon, Charalampos Markakis, **Kotaro Fujisawa**, Antonios Tsokaros, Keisuke Taniguchi & Yoshiharu Eriguchi
“New code for equilibriums and quasiequilibrium initial data of compact objects. IV. Rotating relativistic stars with mixed poloidal and toroidal magnetic”
Physical Review D, 100, id.123019(R) (2019)
- 14. Kazumi Kashiyama, **Kotaro Fujisawa**, & Toshikazu Shigeyama
“The optically thick rotating magnetic wind from a massive white dwarf merger product”
The Astrophysical Journal, 887, 39, 8pp (2019)
- 13. **Kotaro Fujisawa**, Hirotada Okawa, Yu Yamamoto &, Shoichi Yamada
“Effects of rotation and magnetic field on the revival of a stalled shock in supernova explosions”
The Astrophysical Journal, 872, 155, 17pp (2019)
- 12. Nobutoshi Yasutake, **Kotaro Fujisawa**, Shoichi Yamada,
“Rotational equilibria by Lagrangian variational principle: towards multidimensional stellar evolutions”
Monthly Notices of the Royal Astronomical Society, 463, 3705–3724 (2016)
- 11. Ryosuke Hirai, Hiroki Nagakura, Hirotada Okawa, **Kotaro Fujisawa**
“Hyperbolic Self-Gravity Solver for Large Scale Hydrodynamical Simulations”
Physical Review D, 93, Issue 8, id.083006, (2016)
- 10. **Kotaro Fujisawa**,
“A versatile numerical method for obtaining structures of rapidly rotating baroclinic stars: snoeff-consistent and systematic solutions with shellular-type rotation”,
Monthly Notices of the Royal Astronomical Society, 454, 3060–3072, (2015)

- 9. **Kotaro Fujisawa**,
“Magnetized stars with differential rotation and a differential toroidal field”,
Monthly Notices of the Royal Astronomical Society, 450, pp. 4016–4024 (2015)
- 8. **Kotaro Fujisawa** & Yoshiharu Eriguchi,
“Appearance of the prolate and the toroidal magnetic field dominated stars - Analytic approach”,
Publications of the Astronomical Society of Japan, 67(3), 53. (2015)
- 7. Nobutoshi Yasutake, **Kotaro Fujisawa** & Shoichi Yamada,
“A Novel Formulation by Lagrangian Variational Principle for Rotational Equilibria: Toward
Multi-Dimensional Stellar Evolutions”,
Monthly Notices of the Royal Astronomical Society Letters, 446, L56-L60 (2015)
- 6. Kōji Uryū, Eric Gourgoulhon, Charalampos Markakis, **Kotaro Fujisawa**, Antonios Tsokaros,
Yoshiharu Eriguchi,
“Equilibrium solutions of relativistic rotating stars with mixed poloidal and toroidal magnetic
fields”,
Physical Review D, 90, Issue 10, id.101501(R) (2014)
- 5. **Kotaro Fujisawa** & Shota Kisaka,
“Magnetic field configurations of a magnetar throughout its interior to exterior – core, crust and
magnetosphere”,
Monthly Notices of the Royal Astronomical Society, 445, pp. 2777-2793 (2014)
- 4. **Kotaro Fujisawa** & Yoshiharu Eriguchi,
“Prolate stars due to meridional flow”,
Monthly Notices of the Royal Astronomical Society Letters, 438, L61-L65 (2014)
- 3. **Kotaro Fujisawa** & Yoshiharu Eriguchi,
“Coexistence of oppositely flowing multi- φ -currents: Key to large toroidal magnetic fields within
stars”,
Monthly Notices of the Royal Astronomical Society, 432, pp. 1245-1263 (2013)
- 2. **Kotaro Fujisawa**, Rohta Takahashi, Shijun Yoshida & Yoshiharu Eriguchi,
“Counter effects of meridional flows and magnetic fields in stationary axisymmetric self-gravitating
barotropes under the ideal MHD approximation: Clear examples – toroidal configurations”,
Monthly Notices of the Royal Astronomical Society, 431, pp. 1453-1469 (2013)
- 1. **Kotaro Fujisawa**, Shin'ichirou Yoshida & Yoshiharu Eriguchi,
“Axisymmetric and stationary structures of magnetized barotropic stars with extremely strong
magnetic fields deep inside”,
Monthly Notices of the Royal Astronomical Society, 422, pp. 434-448 (2012)