

Fethi M. Ramazanoglu

| | | |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CONTACT INFORMATION | Assistant Professor of Physics Department of Physics Koç University Rumelifeneri Yolu 34450, Istanbul, Turkey | <i>Phone:</i> +90 212 3381357 <i>E-mail:</i> framazanoglu@ku.edu.tr <i>Web:</i> ku.edu.tr/ramazanoglu/ https://scholar.google.com/citations |
| RESEARCH INTERESTS | General relativity and physics of compact objects: numerical relativity, general relativistic hydrodynamics (GRHD), alternative theories of gravity, formal aspects of classical general relativity, quantum gravity, black hole evaporation Foundations of quantum mechanics | |
| EDUCATION | Princeton University , Princeton, NJ, USA | |
| | Ph.D. in Physics, | June 2012 |
| | <ul style="list-style-type: none">• Thesis Topic: <i>Evaporation of two dimensional black holes</i>• Adviser: Prof. Frans Pretorius | |
| | Massachusetts Institute of Technology , Cambridge, MA, USA | |
| | B.S. in Physics, B.S. in Mathematics | June 2006 |
| | <ul style="list-style-type: none">• Thesis Topic: <i>Scattering and Mesons</i>• Adviser: Prof. Robert Jaffe• Inductee of honor societies <i>Sigma Pi Sigma</i> and <i>Phi Beta Kappa</i> | |
| ACADEMIC EXPERIENCE | Assistant Professor of Physics Department of Physics, Koç University, Istanbul, Turkey | June 2016- |
| | Postdoctoral Research Associate DAMTP, University of Cambridge, Cambridge, UK | September 2014-August 2016 |
| | Numerically investigated alternative theories of gravitation: mainly the spontaneous scalarisation scenario in scalar-tensor theories of gravity, and also modifications of general relativity arising from trace dynamics. Performed numerical evolution of scalar hair in black holes, dynamical superradiance for charged rotating black holes. | |
| | Postdoctoral Research Associate Department of Physics, Princeton University, Princeton, NJ USA | July 2012-August 2014 |
| | Developed initial data solvers for numerical general relativity, add capabilities for alternative theories of gravitation to the existing numerical code GH3D2M that performs fully general relativistic hydrodynamics with adapted mesh refinement (AMR), implemented numerical calculation of metric perturbations in Teukolsky formalism to investigate superradiance of gravitational waves. | |
| | Graduate Fellow-Teaching/Research Assistant Department of Physics, Princeton University, Princeton, NJ USA | September 2006-June 2012 |
| | Developed and implemented methods to numerically evolve the Callan-Giddings-Harvey-Strominger (CGHS) model, investigated black hole evaporation in this context. Co-developed a general relativistic initial data solver. | |

Visiting Researcher June 2007-September 2007
Institute for Neuroinformatics, Federal Technical Research Institute (ETH), Zurich, Switzerland
Analysis of single neuron recordings from zebra finch brain areas HVC and RA.

Undergraduate Researcher June 2003-June 2006
Massachusetts Institute of Technology, Cambridge, MA USA
Investigated a novel method to analyze meson scattering data based on the R -matrix.
Co-developed a neural connection model to explain bird song in zebra finches.

TEACHING
EXPERIENCE

Koç University, Istanbul, Turkey

Lecturer September 2016-
Lecturer for Math 503: Applied Mathematics I, Physics 101: General Physics, Physics 102:
General Physics II, Science 104: Exploring the Universe
Gives the main lectures, prepares homework and exams, coordinates teaching assistants.

Princeton University, Princeton, NJ

Teaching Assistant September 2007-January 2012
Graded problem sets and exams, prepared solution sets, held problem sessions for the
courses Classical Mechanics, Statistical Mechanics, Quantum Mechanics I-II.
Laboratory instructor for Introductory Physics II

Massachusetts Institute of Technology, Cambridge, MA

Grader February 2003-June 2006
Graded problem sets and exams for the courses Vibrations and Waves (Physics III), Rela-
tivity, Statistical Mechanics, Quantum Mechanics I-II-III

PUBLICATIONS

- [1] Fethi M. Ramazanoğlu
Various paths to the spontaneous growth of p -form fields
Turk.J.Phys. 43, 586 (2019) doi:10.3906/FIZ-1908-8
- [2] Fethi M. Ramazanoğlu, Kıvanç İ. Ünlütürk
Disformal coupling can lead to spontaneous tensorization
Phys.Rev. D100, 084026 (2019) doi:10.1103/PhysRevD.100.084026
- [3] Leor Barack et al.
Black holes, gravitational waves and fundamental physics: a roadmap
Class.Quant.Grav. 36, 143001 (2019) doi:10.1088/1361-6382/ab0587
- [4] Fethi M. Ramazanoğlu
Spontaneous tensorization from curvature coupling and beyond
Phys.Rev. D99, 084015 (2019) doi:10.1103/PhysRevD.99.084015
- [5] Fethi M. Ramazanoğlu
Jordan frame beyond scalar-tensor theories
Phys.Rev. D99, 044003 (2018) doi:10.1103/PhysRevD.99.044003
- [6] Fethi M. Ramazanoğlu
Spontaneous growth of gauge fields in gravity through the Higgs mechanism
Phys.Rev. D98, 044013 (2018) doi:10.1103/PhysRevD.98.044013
- [7] Fethi M. Ramazanoğlu
Spontaneous growth of spinor fields in gravity
Phys.Rev. D98, 044011 (2018) doi:10.1103/PhysRevD.98.044011

- [8] Fethi M. Ramazanoğlu
Regularization of instabilities in gravity theories
Phys. Rev. D 97, 024008 (2018) doi:10.1103/PhysRevD.97.024008
- [9] Fethi M. Ramazanoğlu
Spontaneous growth of vector fields in gravity
Phys. Rev. D 96, 064009 (2017) doi:10.1103/PhysRevD.96.064009
- [10] Fethi M. Ramazanoğlu, Frans Pretorius
Spontaneous scalarization with massive fields
Phys. Rev. D 93, 064005 (2016) doi:10.1103/PhysRevD.93.064005
- [11] Stephen L. Adler, Fethi M. Ramazanoğlu
Equations from static vacuum solutions arising from trace dynamics modifications to gravitation
Int. J. Mod. Phys. D 24, 1550011 (2015) doi:10.1142/S021827181550011X
- [12] William E. East, Fethi M. Ramazanoğlu, Frans Pretorius
Black Hole Superradiance in Dynamical Spacetime
Phys. Rev. D 89, 061503 (2014) doi:10.1103/PhysRevD.89.061503
- [13] William E. East, Fethi M. Ramazanoğlu, Frans Pretorius
A conformal thin-sandwich solver for generic initial data
Phys. Rev. D 86, 104053 (2012) doi:10.1103/PhysRevD.86.104053
- [14] Abhay Ashtekar, Frans Pretorius, Fethi M. Ramazanoğlu
Surprises in the Evaporation of 2D Black Holes
Phys. Rev. Lett. 106, 161303 (2011) doi:10.1103/PhysRevLett.106.161303
- [15] Abhay Ashtekar, Frans Pretorius, Fethi M. Ramazanoğlu
Evaporation of two-dimensional black holes
Phys. Rev. D 83, 044040 (2011) doi:10.1103/PhysRevD.83.044040
- [16] Fethi M. Ramazanoğlu, Frans Pretorius
Two-dimensional quantum black holes: numerical methods
Class. Quantum Grav. 27 245027 (2010) doi:10.1088/0264-9381/27/24/245027
(selected as a highlight of 2010-2011)
- [17] Fethi M. Ramazanoğlu
The approach to thermal equilibrium in the Caldeira-Leggett model
J. Phys. A: Math. Theor. 42 265303 (2009) doi:10.1088/1751-8113/42/26/265303
- [18] Stephen L Adler, Fethi M. Ramazanoğlu
Photon-emission rate from atomic systems in the CSL model
J. Phys. A: Math. Theor. 40 13395 (2007) doi:10.1088/1751-8113/40/44/017
- [19] Dezhe Z. Jin, Fethi M. Ramazanoğlu and H. Sebastian Seung
Intrinsic bursting enhances the robustness of a neural network model of sequence generation by avian brain area HVC
J. Comput. Neurosci. 23 283 (2007) doi:10.1007/s10827-007-0032-z

TALKS

Invited

- “Modifying gravity at the strong-field regime” 24th Statistical Physics Days, Izmir, Turkey, June 2017
- “Spontaneous Scalarization of Massive Fields”, University of Aveiro, Aveiro Portugal, December 2015

- “Numerical relativity of Spontaneous Scalarisation”, University of Cambridge, Cambridge UK, October 2014
- “Evaporation of 2-Dimensional Black Holes”, Perimeter Institute for Theoretical Physics Strong Gravity Seminar, Waterloo, ON Canada, November 2012
- “Einstein Prize and New Methods for Old Problems in Gravitational Physics - Evaporation of 2-Dimensional Black Holes”, American Physical Society (APS) April Meeting, Anaheim, CA USA, May 2011
- “Information loss in the CGHS model”, International Loop Quantum Gravity Seminar, March 2010

Contributed

- “Suppression of nonperturbative strong field effects in gravity theories”, American Physical Society (APS) April Meeting, Washington DC, USA, April 2020
- “Exploiting non linearities to evade constraints?”, Numerical Relativity beyond General Relativity, Benasque, Spain, June 2018
- “Regularization of instabilities in gravity theories”, American Physical Society (APS) April Meeting, Columbus, OH USA, April 2018
- “Modifying gravity through instabilities”, COST Action CA16104: GWverse General Meeting, La Valetta, Malta, January 2018
- “Spontaneous Scalarization of Massive Fields”, American Physical Society (APS) April Meeting, Savannah, GA USA, April 2014
- “Spontaneous Scalarization with Dynamical General Relativity”, American Physical Society (APS) April Meeting, Denver, CO USA, April 2013
- “A conformal thin-sandwich solver for generic initial data”, APS April Meeting, Atlanta, GA USA, April 2012
- “Evaporation of 2-Dimensional Black Holes”, Numerical Relativity Beyond Astrophysics, ICMS, Edinburgh, UK, July 2011
- “IDSolve: A Conformal Thin Sandwich Initial Data Solver”, Eastern Gravity Meeting 14, Princeton, NJ USA, June 2011
- “Numerical Simulation of the CGHS Model”, Eastern Gravity Meeting 13, Raleigh, NC USA, May 2010
- “Numerical Analysis of Black Hole Evaporation in the CGHS Model”, APS April Meeting, Washington DC USA, February 2010

GRANTS AND AWARDS

- [1] Science Academy of Turkey Young Scientist Award (2020-2021)
40000TL
- [2] TÜBİTAK 2515-COST Grant No:117F295 (2018-2020)
“Spontaneous Tensorization”
299200TL
- [3] TÜBİTAK 3501 Grant No:117F111 (2018-2020)
“Investigating Hawking radiation in 1 space and 1 time dimensions”
367500TL

- [4] TÜBİTAK KOLT Teaching Innovation Grant(2018)
Purchase of a telescope for teaching activities. 5000TL
- [5] Co-Funded Brain Circulation Scheme, Grant No:116C033 (2016)
“Scalar fields in strong gravitation”.
A one year stipend of €50,000, and research support of €7,200
- [6] Joint Space-Science Institute (JSI) Postdoctoral Grant (2014) –declined
JSI, NASA and the University of Maryland
\$65,000 stipend and \$10,000 research support of for two years, extendable to a third
- [7] Princeton University Graduate Fellowship (2006)
Yearly stipend of \$19,000

ACADEMIC SERVICE Referee for Physical Review Letters, Physical Review D, Classical and Quantum Gravity, European Physical Journal C, International Journal of Modern Physics D, Astronomy and Space Science

TECHNICAL SKILLS Programming: C, C++, Fortran, Matlab, Mathematica
Numerical Methods: Parallel computation, finite difference methods, adaptive mesh refinement.
Fluent in English, native in Turkish

PUBLIC OUTREACH Organizing popular science talks on astrophysics and gravitation at Koç University
Organizing stargazing and basics amateur astronomy sessions for non-scientists

REFERENCES

Frans Pretorius (e-mail: fpretori@princeton.edu; phone: +1 609 258 5858)

- Professor, Department of Physics
Princeton University
- ◇ Jadwin Hall, Princeton, NJ 08544 USA

Ulrich Sperhake (e-mail: U.Sperhake@damtp.cam.ac.uk; phone: +44 1223 766861)

- Lecturer, Department of Applied Mathematics and Theoretical Physics (DAMTP)
University of Cambridge
- ◇ Centre for Mathematical Sciences, Wilberforce Road, Cambridge, CB3 0WA, UK

Stephen L. Adler (e-mail: adler@ias.edu; phone: +1 609 734 8051)

- Professor Emeritus, School of Natural Sciences
Institute for Advanced Study (IAS)
- ◇ Einstein Dr. Princeton, NJ 08540 USA

Abhay Ashtekar (e-mail: ashtekar@gravity.psu.edu; phone: +1 814 863 9601)

- Director, Institute for Gravitation and Cosmos, Eberly Professor of Physics
The Pennsylvania State University
- ◇ 104 Davey Lab, Penn State University Park, PA 16802-6300 USA
- ★ Administrative Assistant: Randi Neshteruk, +1 814 863 9605, rxh1@psu.edu