Furkan Semih Dündar

Curriculum Vitae

Research Interests

Physics

- **Quantum Gravity**.
- **Bohmian Mechanics**.
- **Wolfram Model**.
- **Shape Dynamics**.

Mathematics

- **Differential Geometry**.
- n-**Scales**.

Work

2019–Present **Assistant Professor**, *Amasya University*.
2016–2018 **Research Assistant**, *Boğaziçi University*.

Education

2016–2018 **PhD. in Physics**, *Boğaziçi University*.
2012–2014 **MSc. in Physics**, *Middle East Technical University*.
2007–2012 **BS. in Physics**, *Bilkent University*.

PhD. Thesis

Title *Quantum Phenomena and Shape Dynamics*
Advisor Metin Arık and Levent Akant

Master Thesis

Title *The Firewall Paradox*
Advisor Bayram Tekin

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fsdonbar

Awards and Honors

2015–2018 TÜBİTAK (PhD.) Scholarship

2012–2014 TÜBİTAK (MSc.) Scholarship

2012 Bilkent University, #1 Ranking in Graduation from the Physics Department

2012 Bilkent University, High Honor Degree

2007–2012 Bilkent University, Full Scholarship

2007–2012 TÜBİTAK (BS.) Scholarship

Referee for

- Modern Physics Letters A
- Mathematical Methods in Applied Sciences
- Fundamental Journal of Mathematics and Applications

Books

- Furkan Semih Dündar. *Kuantum Görelilik Kütleçekimi: Yeni fiziğin püf noktaları*. (Popular physics book in Turkish. The English translation of the title is "Quantum Relativity Gravitation") Say Yayınları. (November 4, 2020). ISBN: 9786050208092
- Furkan Semih Dündar. *The Firewall Paradox: What is wrong with quantum gravity*. Lap Lambert Academic Publishing (December 20, 2016). ISBN: 9783330021754

Publications

1. Furkan Semih Dündar. *Contact Hamiltonian Description of Systems with Exponentially Decreasing Force and Friction that is Quadratic in Velocity*. Fundamental Journal of Mathematics and Applications. Vol. 3, Issue 1, pp. 29–32.
2. Kahraman Esen Özen, Furkan Semih Dündar, Murat Tosun. *An Alternative Approach to Jerk in Motion Along a Space Curve with Applications*. Journal of Theoretical and Applied Mechanics. Vol. 57, Issue 2, pp. 435–444.
3. Furkan Semih Dündar and Metin Arık. *On the Non-Existence of Unbounded Discrete Space-Time*. Mathematical Advances in Pure and Applied Sciences. Vol. 1, Issue 2, pp. 52–55, 2018.
4. Furkan Semih Dündar and Metin Arık. *Bohmian Field Theory on a Shape Dynamics Background and Unruh Effect*. Annals of Physics. Vol. 392, pp. 157–164, 2018. `arXiv:1706.05890`.
5. Furkan Semih Dündar, Soley Ersoy, Nuno T. Sá Pereira. *Bobillier formula for the elliptical harmonic motion*. An. St. Univ. Ovidius Constanta, Ser. Mat. Vol. 26. Issue 1, pp. 103–110, 2018
6. Furkan Semih Dündar and Kamal Hajian. *Quantum Jump from Singularity*

to Outside of Black Hole. JHEP 02 (2016) 175. arXiv:1511.03572

Conference Proceedings

1. Furkan Semih Dündar. *Covid-19 and the Fibonacci Numbers*. 9th International Eurasian Confrence on Mathematical Sciences and Applications. Skopje, North Macedonia. August 25–28 2020. (Appeared in the abstract book)
2. Furkan Semih Dündar. *The Theory of n-Scales*. AIP Conference Proceedings, vol. 1926, p. 020014, 2018. doi: 10.1063/1.5020463.
3. Furkan Semih Dündar and Barış Tamer Tonguç. *Quantum Shape Kinematics*. The Proceeding Book of International Science and Technology Conference 2016. Page 855. November 18, 2016. arXiv:1511.05840

Popular Science Publications

1. Furkan Semih Dündar. *Burçin Ünlü'nün "Büyük buluşma: Fizik ve sanat" yazısı üzerine* (en: On Burçin Ünlü's "Büyük buluşma: Fizik ve sanat"), Bilim ve Ütopya Portalı, September 2020.
2. Furkan Semih Dündar. *Hossenfelder'in "Lost in Math"i üzerine* (en: On Hossenfelder's "Lost in Math"), Bilim ve Ütopya Portalı, March 2020.
3. Furkan Semih Dündar. *Kuantum fotokopiye izin yok* (en: Quantum Xeroxing is not allowed), QTurkey, February 2020.
4. Furkan Semih Dündar. *Kuantum bilgi ve kuantum ışınlanma* (en: Quantum information and quantum teleportation), Bilim ve Ütopya, February 2020.
5. Furkan Semih Dündar. *Kurumsal fizik mümkün. Peki ya sonrası?* (en: Corporate physics is possible. What's next?), Bilim ve Ütopya Portalı, February 2020.
6. Furkan Semih Dündar. *Rovelli'nin yedi kısa dersi hakkında* (en: On Rovelli's seven brief lessons), Bilim ve Ütopya Portalı, November 2019.
7. Furkan Semih Dündar. *Kurumsal fizik mümkün mü?* (en: Is corporate physics possible?), Bilim ve Ütopya Portalı, August 2019.
8. Furkan Semih Dündar. *Atwood Makinesi'nin anlamı* (en: The meaning of Atwood's Machine), Bilim ve Ütopya Portalı, August 2019.
9. Furkan Semih Dündar. *Evrende tüm yönler eşit midir?* (en: Are all the directions in the universe equal?), Bilim ve Ütopya Portalı, July 2019.
10. Furkan Semih Dündar. *Schrödinger'in Kedisi'nin kökeni* (en: The origin of Schrödinger's Cat), Bilim ve Ütopya Portalı, July 2019
11. Furkan Semih Dündar. *Karanlık madde, karanlık enerji ve modifiye kütleçekim kuramları* (en: Dark matter, dark energy and modified gravity theories). Bilim ve Ütopya Portalı. June 2019.
12. Furkan Semih Dündar. *Fizik için özgür yazılımlar* (en: Free softwares for physics). Bilim ve Ütopya Portalı. May 2019.
13. Furkan Semih Dündar. *Kara deliğin gölgesi üzerine kısaca* (en: Briefly on the shadow of the black hole). Bilim ve Ütopya Portalı. April 2019.
14. Furkan Semih Dündar. *Bilimsel ilerleme zinciri ve güven* (en: The chain of

scientific advancement and trust). Bilim ve Ütopya Portalı. April 2019.

15. Furkan Semih Dündar. *Kopenhag yorumuna bir alternatif: Bohm mekaniği* (en: An alternative to Kopenhagen interpretation: Bohmian mechanics). Bilim ve Ütopya Portalı. March 2019.
16. Furkan Semih Dündar. *Einstein'dan Barbour'a: Şekil dinamiğinin kısa tarihi* (en: From Einstein to Barbour: A brief history of shape dynamics). Bilim ve Ütopya. March 2019.
17. Furkan Semih Dündar. *Kara delik nedir? Gerçek midir?* (en: What is a black hole? Is it real?). Bilim ve Ütopya Portalı. February 2019.
18. Furkan Semih Dündar. *Postmodern bilime tutunabilmek* (en: Being able to hold onto postmodern science). Bilim ve Ütopya Portalı. December, 2018.
19. Furkan Semih Dündar. *Sınırsız ayrık uzay-zamanın yokluğu üzerine* (en: On the nonexistence of unbounded discrete space-time). Bilim ve Ütopya Portalı. November 2018.
20. Furkan Semih Dündar and Sadık Şamilov. *Kuantum kütleçekimine giriş* (en: Introduction to quantum gravity). Bilim ve Ütopya. November 2018.
21. Furkan Semih Dündar. *Riemann Hipotezi* (en: Riemann Hypothesis). Bilim ve Ütopya Portalı. October 2018.
22. Furkan Semih Dündar. *Şekil Dinamiğine Giriş* (en: Introduction to Shape Dynamics). Bilim Fili. June 2018. https://bilimfili.com/sekil-dinamigine-giris/
23. Furkan Semih Dündar. *Mach İlkesi Nedir? (en: What is Mach's Principle)*. BilimFili. June 2018. https://bilimfili.com/mach-ilkesi-nedir/
24. Furkan Semih Dündar. *Stephen Hawking ve Kara Delikler (en: Stephen Hawking and Black Holes)*. Bilim ve Ütopya. April 2018.
25. Furkan Semih Dündar. *Mutlak Uzak (en: Absolute Space)*. Bilim ve Teknik. May 2016.
26. Furkan Semih Dündar. *Kütleçekim Dalgaları İlk Kez Gözlemlendi! (en: Gravitational waves has first been observed)*. Bilim ve Teknik, March 2016.
27. Furkan Semih Dündar. *İzafiyet kuramı ve kara delikler (en: Relativity and Black Holes)*. SAÜ Aktüel 2015.
28. Furkan Semih Dündar. *Karadeliğin Ateşten Seddi (en: Black Hole's Wall of Fire)*. Bilim ve Teknik, February 2014.

Workshops and Conferences

August 2020 **9th International Eurasian Confrence on Mathematical Sciences and Applications**, *International Balkan University*, Skopje, "Covid-19 and the Fibonacci Numbers".

June 2018 **5th International Congress on Fundamental and Applied Sciences**, *International Balkan University*, Skopje, "Massive Scalar Field Theory on Discrete n-Scales".

May 2018 **Mathematical Physics Days**, *Koç University*, İstanbul, "Gravitational Collapse of Thin Shell of Dust in Shape Dynamics".

May 2018 **Recent Trends in String Theory and Related Topics**, *IPM*, Tehran, "Gravitational Collapse of Thin Shell of Dust in Shape Dynamics".

Apr. 2018 **13. Ankara Matematik Günleri**, *TOBB ETÜ*, Ankara.

Aug. 2017 **6^{th} International Eurasian Conference on Mathematical Sciences and Applications**, Budapest, Hungary, "The Theory of n-Scales".

Aug. 2017 **Astrofiziksel Diskler Yazokulu**, *Boğaziçi University*, İstanbul.

July 2017 **Adım Physics Days VI**, *Balıkesir University*, Balıkesir, "An invitation to shape dynamics".

May 2017 **Recent Trends in String Theory and Related Topics**, *IPM*, Tehran.

July. 2016 **International Science and Technology Conference**, Wien.

Dec. 2015 **International Conference on Quality in Higher Education**, *Sakarya University*, Sakarya.

Sept. 2015 **International Science and Technology Conference**, St. Petersburg.

Dec. 2014 **X Avogadro Meeting on Strings, Supergravity and Gauge Theories**, *Scuola Normale Superiore*, Pisa.

April 2014 **13th Workshop on Quantization, Dualities and Integrable Systems**, *Koç University*, İstanbul.

Sept. 2013 **Erdal İnönü Group Theory Summer School**, *Boğaziçi University and Bilim Akademisi*, İstanbul.

July 2011 **Physics of Stars**, *ITAP*, Marmaris.

Past Teaching Duties

2020 Fall **MAK 105: Lineer Cebir (Linear Algebra)**, *Amasya University*, Turkey.

2020 Fall **GMAK 105: Lineer Cebir (Linear Algebra)**, *Amasya University*, Turkey.

2020 Fall **MAT 203: Olasılık ve İstatistik (Probability and Statistics)**, *Amasya University*, Turkey.

2020 Fall **GMAT 203: Olasılık ve İstatistik (Probability and Statistics)**, *Amasya University*, Turkey.

2020 Fall **MAK 401: İş Yeri Eğitimi (Workplace Training)**, *Amasya University*, Turkey.

2020 Fall **GMAK 401: İş Yeri Eğitimi (Workplace Training)**, *Amasya University*, Turkey.

2020 Fall **SSD1: Araştırma ve Rapor Hazırlama Teknikleri (Research and Report Preperation Techniques)**, *Amasya University*, Turkey.

2020 Fall **GSSD1: Araştırma ve Rapor Hazırlama Teknikleri (Research and Report Preperation Techniques)**, *Amasya University*, Turkey.

2020 Spring **MAK 106: Bilgisayar Programlama (Computer Programming)**, *Amasya University*, Turkey.

2020 Spring **GMAK 106: Bilgisayar Programlama (Computer Programming)**, *Amasya University*, Turkey.

2020 Spring **MAT 202: Diferansiyel Denklemler (Differential Equations)**, *Amasya University*, Turkey.

2020 Spring **GMAT 202: Diferansiyel Denklemler (Differential Equations)**, *Amasya University*, Turkey.

2020 Spring **SSD2: Entrepreneurship II**, *Amasya University*, Turkey.

2020 Spring **GSSD2: Entrepreneurship II**, *Amasya University*, Turkey.

2020 Spring **MAK408: Bitirme Çalışması (Graduation Project)**, *Amasya University*, Turkey.

2020 Spring **GMAK408: Bitirme Çalışması (Graduation Project)**, *Amasya University*, Turkey.

2018 Spring **Physics 442 Lab sessions**, *Boğaziçi University*, Turkey.

2018 Spring **Physics 101-121 Lab sessions**, *Boğaziçi University*, Turkey.

2017 Fall **Physics 101-121 Lab sessions**, *Boğaziçi University*, Turkey.

2017 Spring **Physics 202 Lab sessions**, *Boğaziçi University*, Turkey.

2016 Fall **Grader for Java Programming Course**, *Boğaziçi University*, Turkey.

2016 Fall **Physics 101-121 Lab sessions**, *Boğaziçi University*, Turkey.

2016 Spring **Physics 101-121 Lab sessions**, *Boğaziçi University*, Turkey.

Popular Science Activities

21–24 June 2016 **Science Festival**, *Sakarya*, Pozitif Bilimevi.

2–5 Aug. 2011 **Astronomy and Physics Festival**, *Marmaris*, ITAP.

7–10 Aug. 2011 **Astronomy and Physics Festival**, *Marmaris*, ITAP.

27–30 Aug. 2011 **Astronomy and Physics Festival**, *Marmaris*, ITAP.

2–5 Sept. 2011 **Astronomy and Physics Festival**, *Marmaris*, ITAP.

19–20 Nov.. 2011 **Astronomy and Physics Festival**, *Marmaris*, ITAP.

24–25 Mar. 2012 **Astronomy and Physics for Teachers**, *Marmaris*, ITAP.

Languages

Turkish	Advanced
English	Advanced
Italian	Elementary
Persian	Elementary
Russian	Elementary

Computer Skills

Machine Learning	**Good**	
C, C++	**Good**	*General purpose*
Mathematica	**Good**	*Symbolic calculations*
Matlab	**Good**	*Numerical calculations*
Adobe Illustrator	**Intermediate**	*Vector drawing*
Haskell	**Intermediate**	*Functional programming*
Python	**Intermediate**	*General purpose*
SciPy, Pandas	**Intermediate**	
Emacs	**Good**	*Including modifications*
LaTeX	**Good**	*Also good at PGF macros for drawing*

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