

# ANDREI C. BURA



My name is Andrei Bura, I am 37 years of age, currently a resident of Romania (EU), yet for the past decade I have lived and worked in the US, in academia. I hold a Ph.D. in Mathematics from Virginia Tech (USA), and also hold a Master's in Mathematics from the University of Southern Denmark (DK) and two separate Bachelor degrees, one in Mathematics and one in Physics, both from Babes Bolyai University (RO). Up until August 2024 I was a Research Scientist and member of the Mathematical Division of the Biocomplexity Institute at the University of Virginia (USA). I operated inter-disciplinarily, within small teams with a high degree of independence and was responsible for designing and performing problem-driven fundamental research in pure math and in applied bio-mathematics, with an emphasis on combinatorics, algebra, topology bio-informatics, computational genomics and data science. Furthermore, I was responsible for designing and writing research projects and grant proposals aimed at a variety of scientific agencies (NSF, NIH, CDC, VDH, DARPA, CASI, Trinity, Simons Foundation), sometimes taking lead roles as PI or co-PI. My work has been at the intersection of discrete mathematics, algebraic topology and biology. I have published several papers on these topics, all in esteemed journals such as Discrete Mathematics, Journal of Algebraic Combinatorics, and Rocky Mountain Journal of Mathematics, to name a few. I have also fostered an applied bio-mathematics line that investigates aligned sequences over finite alphabets, in applied contexts spanning molecular RNA bi-structures to large scale data arrays comprised of viral genomic alignments. This was done from varied perspectives like information theory, topological data analysis, hyper distances, and homological algebra. This has manifested in publications, in the Journal of Mathematical Biology and in RNA, as well as a seminal paper in the Proceedings of the Royal Society A which deals with symbol entropies theorems of site linkage spectra for MSAs, allowing for computationally tractable algorithms that can classify sequence arrays based on particular information theory metrics. I have participated both as an invited speaker, and sometimes as an organizer, to various conferences and symposia with mathematical, biological, interdisciplinary and educational profiles (BEER, SIAMADS, BIRS, ACSB). I have also been involved in community outreach programs, for instance in the context of the P2PE: Contagion Science Program, and have received positive feedback on my scientific dissemination and outreach efforts.

## Personal

### Adresă

[Redacted]

### Număr de telefon

[Redacted]

### E-mail

anbur12@vt.edu

### Data de naștere

1 [Redacted]

### Loc de naștere

Alba Iulia

### Sex

Bărbat

### Naționalitate

Romana

### Stare civilă

Necasatorit

### Site

<https://scholar.google.com/citations?user=uTF1xqYAAAAJ&hl=en>

### LinkedIn

<linkedin.com/in/cotiso-andrei-bura-11675937a>

## Interese

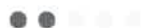
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- design pentru TTRPG-uri
- fizica teoretica

## Limbi

Engleza



Franceza



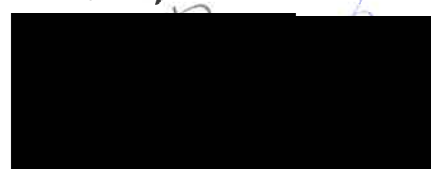
## Experiență de lucru

<b>Lector Dr.</b> Universitatea 1 Decembrie 1918, Alba Iulia	ian. 2025 - Prezent
<b>Cercetator in Divizia de Matematica BII</b> University of Virginia, Charlottesville VA	2022 - 2024
<b>Asociat Postdoctoral in cercetare</b> University of Virginia, Charlottesville VA	2020 - 2022
<b>Asistent Doctorand in cercetare</b> Virginia Polytechnic Institute and State University, Blacksburg VA	2015 - 2019
<b>Profesor de Matematica</b> Sc. Gen. Ampoita, Metes AB	2011 - 2012

## Educație și calificări

<b>PhD Matematica</b> Virginia Polytechnic Institute and State University, Blacksburg VA	2019
<b>MSc Matematica</b> Syddansk Universitet, Odense DK	2014
<b>BSc Matematica</b> Universitatea Babes Bolyai, Cluj Napoca	2012
<b>BSc Fizica</b> Universitatea Babes Bolyai, Cluj Napoca	2009

10/06/2026



## Referințe

**Christian Reidys**  
+1 (434) 964-8712  
duckcr@gmail.com

University of Virginia  
- Mathematics  
Department

**Martin Svensson**  
+4565502389  
svensson@imada.sdu.dk

Syddansk Universitet  
- Mathematics  
Department

**Matthew Macauley**  
+1 (864) 656-1838  
macaule@clemson.edu

Clemson University -  
Mathematics  
Department

**Sorin Istrail**  
+1 (401) 863-6196  
sorin\_istrail@brown.edu

Brown University -  
Istrail Lab

**Michael Waterman**  
+1 (213) 740-8631  
msw@usc.edu

Univeristy of  
Southern California -  
Dornsife

## Abilități

LaTeX	● ● ● ● ● ●
Wolfram Mathematica	● ● ● ● ● ●
Microsoft Word	● ● ● ● ● ●
Excel	● ● ● ● ● ●
Python	● ● ● ● ● ●
C++	● ● ● ● ● ●

## Publicații

- [1] A.C. Bura, N.S. Dutta, T.J.X. Li, C.M. Reidys. A computational framework for weighted simplicial homology. *Topology and its applications*, 360(109177), (2025).
- [2] \*C. Barrett, A. Bura, F. Huang, C. Reidys. Towards an information theoretic framework for MSA sub-sampling. *Proc. R. Soc. A*. 480(2304), (2024).
- [3] \*A.C. Bura, Q. He, C.M. Reidys. The combinatorics of weighted cohomology. *Rocky Mountain J. Math.*. Acceptat - in curs de aparitie.
- [4] C. Barrett, A.C. Bura, Q. He, F.W. Huang, T.J.X. Li, C.M. Reidys. Motifs in SARS-CoV-2 evolution. *RNA*. Acceptat - in curs de aparitie.
- [5] \*C. Barrett, A. Bura, Q. He, F. Huang and C. Reidys. The arithmetic topology of genetic alignments. *J. Math. Biol.* 86(3), (2023) 34 (30 pagini).
- [6] \*A.C. Bura, Q. He, C.M. Reidys Loop homology of bi-secondary structures II. *J. Algebr. Comb.* 56(3), (2022), 785–798.
- [7] \*A.C. Bura, Q. He, C.M. Reidys. Loop homology of bi-secondary structures. *Discrete Math.* 344(6), (2021), 112371 (13 pagini).
- [8] C. Barrett, A.C. Bura, Q. He, F.W. Huang, T.J.X. Li, M.S. Waterman, C.M. Reidys. Multiscale feedback loops in SARS-CoV-2 viral evolution. *J. Comput. Biol.* 28(3), (2021), 248–256.
- [9] A.C. Bura, Q. He, C.M. Reidys. Weighted homology of bi-structures over certain discrete valuation rings. *Mathematics* 9(7), (2021), 744 (19 pagini).
- [10] R.X.F. Chen, C.M. Reidys, A.C. Bura. D-chain tomography of networks: a new

structure spectrum and an application to the SIR process. *SIAM J. Appl. Dyn. Syst.* 18(4), (2019) 2181—2201.

[11] Mark G. Orr, Emily S. Teti, Andrei Bura, Henning Mortveit. Theoretical note: The relation between structure and dynamics in psychological networks of attitudes. In review in jurnalul *Psychological Review*, (2024).

Clarivate - Web of Science - Researcher ID: DUY-8953-2022:

<https://www.webofscience.com/wos/woscc/summary/188d76b6-2ab5-433b-9ecc-970d73a264>

ORCID: <https://orcid.org/0000-0002-4481-4204>



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