# Răzvan V. Chereji

## CONTACT

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## SUMMARY

- Theoretical physicist, using statistical mechanics to model biological systems. My research focuses on DNA packaging, chromatin organization, and gene regulation.
- Author of >20 peer-reviewed articles (most of them as first or co-first author), more than 650 citations (see my Google Scholar profile).
- Awarded for research, reviewing, and teaching; multiple prizes at international and national Physics Olympiads (see Awards section below).
- Invited author of a book chapter; invited keynote speaker at international conference in Canada; invited speaker at a summer school in Argentina; presented talks and posters at many conferences and seminars.
- Reviewer for many prestigious journals, such as Science, Nature, Biophysical Journal, Molecular Cell, Nucleic Acids Research, Genome Research.
- I collaborated with 15 laboratories, including collaborations initiated by me, independently of my advisors.
- Intermediate programmer in Python, R, MATLAB. I wrote custom-made scripts for all data analyses in my research.

## EDUCATION

**National Institutes of Health (NIH), NICHD, Bethesda, MD, U.S.A.**

*Research Fellow* **2016–present**

*Visiting Fellow* **2013–2016**

- Advisor: Dr. David J. Clark

**Rutgers, The State University of New Jersey, Piscataway, NJ, U.S.A.**

*Ph.D. in Physics* **2007–2013**

- Advisor: Prof. Alexandre V. Morozov; Thesis link
- Cumulative GPA: 3.90 / 4

**Babeş-Bolyai University, Cluj-Napoca, CJ, Romania**

*B.Eng.* **2002–2007**

- Advisor: Prof. Emil Vinţeler
- Graduated as valedictorian; Thesis GPA: 10 / 10; Cumulative GPA: 9.83 / 10

## AWARDS

Fellows Award for Research Excellence (FARE award), NIH **2017, 2018**
"Outstanding Contribution in Reviewing" award from Genomics, Elsevier **2017**
Richard J. Plano Outstanding Teaching Assistant Award, Rutgers University **2009**
**Silver Medal** at the International Physics Olympiad, Indonesia **2002**
Excellency Diploma awarded by the President of Romania **2001, 2002**
**Bronze Medal** at "Tuymaada" International Olympiad, Russia **2001**
**First Prize** at Romanian National Physics Olympiad **1999, 2000, 2002**

25. **Chereji RV**, Bryson TD, Henikoff S – Quantitative MNase-seq accurately maps nucleosome occupancy levels, To appear in Genome Biol.

24. **Chereji RV***, Eriksson PR*, Ocampo J*, Prajapati HK, Clark DJ – Accessibility of promoter DNA is not the primary determinant of chromatin-mediated gene regulation, To appear in Genome Res.

23. Ocampo J*, **Chereji RV***, Eriksson PR, Clark DJ – Contrasting roles of the RSC and ISW1/CHD1 chromatin remodelers in RNA polymerase II elongation and termination, Genome Res. (2019), doi: 10.1101/gr.242032.118

22. Hamdani O, Dhillon N, Hsieh T-HS, Fujita T, Ocampo J, Kirkland JG, Lawrimore J, Kobayashi TJ, Friedman B, Fulton D, Wu KY, **Chereji RV**, Oki M, Bloom K, Clark DJ, Rando OJ, Kamakaka RT - Transfer RNA Genes Affect Chromosome Architecture and Function via Local Effects, Mol. Cell. Biol. (2019), doi: 10.1128/MCB.00432-18

21. Chang HW, Valieva ME, Safina A, **Chereji RV**, Wang J, Kulaeva OI, Morozov AV, Kirpichnikov MP, Feofanov AV, Gurova K, Studitsky VM – Mechanism of FACT Removal from Transcribed Genes by Anti-Cancer Drugs Curaxins, Science Advances 4 (11), eaav2131 (2018).

20. Mehta GD, Ball DA, Eriksson PR, **Chereji RV**, Clark DJ, McNally JG, Karpova TS - Single-Molecule Analysis Reveals Linked Cycles Of RSC Chromatin Remodeling and Ace1p Transcription Factor Binding in Yeast, Mol. Cell 72 (5), 875-887.e9 (2018).

19. Rawal Y*, **Chereji RV***, Qiu H, Ananthakrishnan S., Chhabi G., Clark DJ, Hinnebusch AG – SWI/SNF and RSC cooperate to reposition and evict promoter nucleosomes at highly expressed genes in yeast, Genes Dev. 32 (9-10), 695-710 (2018).

18. Ouda R, Sarai N, Nehru V, Patel MC, Debrosse M, Bachu M, **Chereji RV**, Eriksson PR, Clark DJ, Ozato K - SPT6 interacts with NSD2 and facilitates interferon-induced transcription, FEBS Lett. 592(10), 1681-1692 (2018).

17. **Chereji RV**[†], Clark DJ[†] – Major determinants of nucleosome positioning, Biophys. J. 114 (10), 2279-2289 (2018).

16. Rawal Y*, **Chereji RV***, Valabhoju V, Qiu H, Ocampo J, Clark DJ, Hinnebusch AG – Gcn4 binding in coding regions can activate internal and canonical 5' promoters in yeast, Mol. Cell 70 (2), 297-311 (2018).

15. **Chereji RV***, Ramachandran S*, Bryson TD, Henikoff S – Precise genome-wide mapping of single nucleosomes and linkers in vivo, Genome Biol. 19, 19 (2018).

14. Johnson TA*, **Chereji RV***, Stavreva DA, Morris S, Hager GL, Clark DJ – Conventional and Pioneer Modes of Glucocorticoid Receptor Interaction with Enhancer Chromatin in vivo, Nucleic Acids Res. 46 (1), 203-214 (2018).

13. **Chereji RV***, Bharatula V*, Elfving N, Blomberg J, Larsson M, Morozov AV, Broach JR, Björklund S – Mediator binds to boundaries of chromosomally interacting domains and to proteins involved in DNA looping, RNA metabolism, chromatin remodeling, and actin assembly, Nucleic Acids Res. 45 (15), 8806-8821 (2017).

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***These authors contributed equally**
[†]**Corresponding author**

12. **Chereji RV***, Ocampo J*, Clark DJ – MNase-sensitive complexes in yeast: nucleosomes and non-histone barriers, Mol. Cell 65 (3), 565–577 (2017).

11. Ocampo J*, **Chereji RV***, Eriksson PR, Clark DJ – The ISW1 and CHD1 ATP-dependent chromatin remodelers compete to set nucleosome spacing in vivo, Nucleic Acids Res. 44 (10), 4625-4635 (2016).

10. Qiu H*, **Chereji RV***, Hu C, Cole HA, Rawal Y, Clark DJ, Hinnebusch AG – Genome-wide cooperation by HAT Gcn5, remodeler SWI/SNF, and chaperone Ydj1 in promoter nucleosome eviction and transcriptional activation, Genome Res. 26 (2), 211-225 (2016).

9. **Chereji RV***, Kan T-W*, Grudniewska MK, Romashchenko AV, Berezikov E, Zhimulev IF, Guryev V, Morozov AV, Moshkin YM – Genome-wide profiling of nucleosome sensitivity and chromatin accessibility in Drosophila melanogaster, Nucleic Acids Res. 44 (3): 1036-1051 (2016).

8. **Chereji RV**, Morozov AV – Functional roles of nucleosome stability and dynamics, Brief. Funct. Genomics 14 (1), 50-60 (2015).

7. Cole HA, Ocampo J, Iben JR, **Chereji RV**, Clark DJ – Transcription of Induced Genes in Yeast Correlates with Differential Loss of Histone H2A-H2B Dimers from Coding Regions, Nucleic Acids Res. 42 (20), 12512-12522 (2014).

6. Ganguli D*, **Chereji RV***, Iben JR, Cole HA, Clark DJ – RSC-dependent Constructive and Destructive Interference between Opposing Arrays of Phased Nucleosomes in Yeast, Genome Res. 24 (10), 1637-1649 (2014).

5. **Chereji RV**, Morozov AV – Ubiquitous nucleosome crowding and unwrapping in the yeast genome, Proc. Natl. Acad. Sci. USA 111 (14), 5236-5241 (2014).

4. Elfving N*, **Chereji RV***, Bharatula V, Björklund S, Morozov AV, Broach JR – A dynamic interplay of nucleosome and Msn2 binding regulates kinetics of gene activation and repression following stress, Nucleic Acids Res. 42 (9), 5468-5482 (2014).

3. Petrenko N, **Chereji RV**, McClean MN, Morozov AV, Broach JR – Noise and interlocking signaling pathways promote distinct transcription factor dynamics in response to different stresses, Mol. Biol. Cell 24 (12), 2045-2057 (2013).

2. **Chereji RV**, Morozov AV – Statistical mechanics of nucleosomes constrained by higher-order chromatin structure, J. Stat. Phys. 144 (2), 379-404 (2011).

1. **Chereji RV**, Tolkunov D, Locke G, Morozov AV – Statistical mechanics of nucleosome ordering by chromatin-structure-induced two-body interactions, Phys. Rev. E 83 (5), 050903 (2011).

SUBMITTED

1. Clark S, **Chereji RV**, Lee P, Fields D, Clark DJ – Differential nucleosome spacing in neurons and glia, In revision at Neuroscience Letters.

*__These authors contributed equally__

## IN PREPARATION

1. **Chereji RV** – The universality of nucleosome organization, from yeast to human, In preparation.

2. **Chereji RV** – Robust estimation of nucleosome spacing at the gene level, In preparation.

## BOOK CHAPTERS

1. Beati P*, **Chereji RV***† – Use of *plot2DO* for creating 2D occupancy plots, Invited chapter in Methods in Molecular Biology, In production.

## INVITED TALKS

| | |
|---|---|
| Workshop, IMPaM CONICET-UBA Institute, Buenos Aires, Argentina | **Nov 2018** |
| Seminar, "Dr. Héctor N. Torres" Institute, Buenos Aires, Argentina | **Nov 2018** |
| **Keynote Speaker** at The 3rd International Conference on Molecular Biology & Nucleic Acids, Toronto, Canada | **Aug 2018** |
| Biowulf Seminar Series, NIH, Bethesda, MD | **Mar 2018** |
| Biophysical Society 62st Annual Meeting, San Francisco, CA | **Feb 2018** |
| 13th Annual NICHD Fellows Meeting, Washington, DC | **May 2017** |
| Departmental Seminar, Physics Department, University of Minnesota, Minneapolis, MN | **Apr 2017** |
| Departmental Seminar, Department of Computational and Systems Biology, University of Pittsburgh, Pittsburgh, PA | **Dec 2016** |
| Departmental Seminar, Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA | **Dec 2016** |
| Biophysics Seminar, Physics Department, University of Minnesota, Minneapolis, MN | **Nov 2016** |
| Chromatin-DECODE Seminar, NIH, Bethesda, MD | **Apr 2015** |
| APS March Meeting, San Antonio, TX (invited talk + contributed talk) | **Mar 2015** |
| BioMaPS Institute for Quantitative Biology Student Seminar, Rutgers University, Piscataway, NJ | **Sep 2013** |
| David Clark laboratory, NIH, Bethesda, MD | **Jun 2013** |
| Jun Song laboratory, UCSF, San Francisco, CA | **Jun 2013** |

## OTHER PRESENTATIONS

| | |
|---|---|
| Biophysical Society 63rd Annual Meeting, Baltimore, MD (poster) | **Mar 2019** |
| PGD Monday AM Seminar, NIH, Bethesda, MD | **Dec 2018** |
| CSHL Epigenetics & Chromatin Meeting, Cold Spring Harbor, NY (poster) | **Sep 2018** |
| NICHD Scientific Retreat, NIH, Bethesda, MD (poster) | **Sep 2018** |
| PGD Monday AM Seminar, NIH, Bethesda, MD | **Jan 2018** |
| Workshop on Chromosome Biology, Bethesda, MD (contributed talk) | **Dec 2017** |

***These authors contributed equally**
**†Corresponding author**

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|---|---|
| Washington Area Yeast Club Meeting, Bethesda, MD (contributed talk) | **Nov 2017** |
| NICHD Scientific Retreat, NIH, Bethesda, MD (poster) | **Sep 2017** |
| CSHL Mechanisms of Eukaryotic Transcription Meeting, Cold Spring Harbor, NY (poster) | **Aug 2017** |
| APS March Meeting, New Orleans, LA (contributed talk) | **Mar 2017** |
| Biophysical Society 61st Annual Meeting, New Orleans, LA (poster) | **Feb 2017** |
| PGD Monday AM Seminar, NIH, Bethesda, MD | **Jan 2017** |
| NCI Symposium on Chromosome Biology, NIH, Bethesda, MD (poster) | **Nov 2016** |
| CSHL Epigenetics & Chromatin Meeting, Cold Spring Harbor, NY (poster) | **Sep 2016** |
| NICHD Scientific Retreat, NIH, Bethesda, MD (poster) | **Sep 2016** |
| 12th Annual NICHD Fellows Meeting, Washington, DC (poster) | **Apr 2016** |
| APS March Meeting, Baltimore, MD (contributed talk) | **Mar 2016** |
| Biophysical Society 60th Annual Meeting, Los Angeles, CA (poster) | **Feb 2016** |
| PGD Monday AM Seminar, NIH, Bethesda, MD | **Jan 2016** |
| NIH Research Festival, NIH, Bethesda, MD (poster) | **Sep 2015** |
| 34th Summer Symposium in Molecular Biology, Penn State University, State College, PA (poster) | **Jul 2015** |
| FASEB conference: Transcription, Chromatin, and Epigenetics, Palm Beach, FL (poster) | **Jun 2015** |
| 11th Annual NICHD Fellows Meeting, Washington, DC (poster) | **May 2015** |
| PGD Monday AM Seminar, NIH, Bethesda, MD | **May 2015** |
| NCI Symposium on Chromosome Biology, NIH, Bethesda, MD (poster) | **Apr 2015** |
| Keystone Symposia: DNA Methylation / Epigenomics, Keystone, CO (poster) | **Mar 2015** |
| Biophysical Society 59th Annual Meeting, Baltimore, MD (poster) | **Feb 2015** |
| CSHL Epigenetics & Chromatin Meeting, Cold Spring Harbor, NY (poster) | **Sep 2014** |
| NICHD Scientific Retreat, NIH, Bethesda, MD (poster) | **Jun 2014** |
| PGD Monday AM Seminar, NIH, Bethesda, MD | **Jun 2014** |
| 10th Annual NICHD Fellows Meeting, Washington, DC (poster) | **Apr 2014** |
| APS March Meeting, Denver, CO (contributed talk) | **Mar 2014** |
| Biophysical Society 58th Annual Meeting, San Francisco, CA (poster) | **Feb 2014** |
| APS March Meeting, Baltimore, MD (contributed talk) | **Mar 2013** |
| Biophysical Society 57th Annual Meeting, Philadelphia, PA (poster) | **Feb 2013** |
| 108th Statistical Mechanics Conference, Rutgers University, Piscataway, NJ (contributed talk) | **Dec 2012** |
| The 8th Gotham-Metro Condensed Matter Meeting, The New York Academy of Sciences, New York, NY (poster) | **Nov 2012** |

Biophysical Society Pennsylvania Network Meeting,
Lehigh University, Bethlehem, PA (poster) **Sep 2012**

## PROFESSIONAL ACTIVITIES

**Reviewer**

- Independent:
  - Science
  - Nature Communications
  - Biophysical Journal
  - Nucleic Acids Research
  - Cell Reports
  - Epigenetics & Chromatin
  - Scientific Reports
  - Epigenetics
  - PLoS ONE
  - Genomics
  - BMC Molecular Biology
  - Journal of Biomolecular Structure & Dynamics
- Jointly with my advisor: Nature, Molecular Cell, Genome Research

**Service**

- Biophysical Society 62nd Annual Meeting **2018**
  - Chair of the "Chromatin and the Nucleoid" session
- 3rd International Conference on Molecular Biology & Nucleic Acids **2018**
  - Chair of the "Carcinogenesis, Gene Targets and Pathways" session
- Member of the DDB Fellows' seminar committee **2015–present**
  - Chair **2016–2017**
  - Co-chair **2015–2016**
- Member of the Chromatin-DECODE seminar committee **2016–present**

**Member**

- American Physical Society, Biophysical Society

## TEACHING EXPERIENCE

| | |
|---|---|
| General Physics II | **Summer 2012** |
| General Physics II | **Summer 2010** |
| Extended Analytical Physics II | **Spring 2010** |
| Extended Analytical Physics I | **Fall 2009** |
| General Physics II | **Summer 2009** |
| Extended Analytical Physics II | **Spring 2009** |
| Extended Analytical Physics I | **Fall 2008** |

## SCHOLARSHIPS

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|---|---|
| Graduate Assistantship, Rutgers University | **2010–2013** |
| Teaching Assistantship, Rutgers University | **2008–2010** |
| Excellence Fellowship, Rutgers University | **2007–2008** |
| University Merit Scholarship, Babeş-Bolyai University | **2002–2007** |
| Romanian Ministry of Education Scholarship | **2002–2007** |
| "Petrom" Scholarship, OMV Petrom S.A. | **2002–2007** |

## TEST SCORES

Ph.D. Candidacy Examination, overall percentage: **89.1%** (best score) **Aug 2008**
GRE Subject: Physics, score: **990 / 990** **Nov 2006**

## TECHNICAL SKILLS

**Programming/Scripting Languages**

- Currently using: Python, R, MATLAB/Octave, Bash
- Used in the past: Basic, C, Fortran, FoxPro, Pascal

**Genomic Data Analyses**

- ATAC-seq, Chemical cleavage mapping, ChIP-exo, ChIP-seq, DNase-seq, FAIRE-seq, MNase-seq, NET-seq, RNA-seq
- Developed a novel method (quantitative MNase-seq) for measuring nucleosome occupancy and chromatin accessibility

**Other skills**

- Intermediate Linux/UNIX skills, git
- LaTeX, Illustrator

## REFERENCES

**Alexandre V. Morozov** (Ph.D. advisor)
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Director, Center for Quantitative Biology
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**David J. Clark** (Post-doctoral advisor)
Senior Investigator, Division of Developmental Biology
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**Steven Henikoff**
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Investigator, Howard Hughes Medical Institute
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**James R. Broach**
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