

# Curriculum Vitae of Jérôme Bürki

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## Education

1991 - 1996 Undergraduate studies in Physics at the Swiss Federal  
Institute of Technology (EPFL), in Lausanne, Switzerland

March 1996 Degree in Physics (Diplôme d'Ingénieur Physicien EPF)  
"Fractional Statistics in a One-Dimensional Quantum Model"  
Diploma work, directed by Prof. Ch. Gruber, EPFL

July 1996 - March 2000 Ph.D. student, at the Institut Romand de Recherche numérique  
en physique des Matériaux (IRRMA) and University of Fribourg

December 1999 Ph.D., University of Fribourg, Switzerland  
"Transport and cohesive properties of metallic nanocontacts:  
A free-electron model"  
Directed by Prof. D. Baeriswyl, University of Fribourg, Switzerland,  
and Prof. X. Zotos, University of Crete, Crete.

## Positions Held

04/2000 - 06/2000 Visiting Scholar, University of Arizona, Tucson, AZ

09/2000 - 08/2001 Postdoctoral Fellow, Harvard University

08/2001 - 08/2002 Visiting Research Scientist, University of Arizona, Tucson, AZ

09/2002 - 12/2003 Postdoc at the Albert-Ludwigs-University, Freiburg, Germany

01/2004 - 08/2008 Research Associate, University of Arizona, Tucson AZ

09/2008 - 08/2014 Assistant Professor of Physics, California State University, Sacramento

09/2014 - 07/2020 Associate Professor of Physics, California State University, Sacramento

08/2020 - present Professor of Physics, California State University, Sacramento

## Awards & Fellowships

2000	ABB prize of the Swiss Physical Society for my contribution to research on “Cohesion and conductance of disordered metallic contacts”
2001 – 2002	Postdoctoral fellowship from the Swiss National Science Foundation
2010	President, UEI Faculty Grant Award for professional development
2010	Award from CSUS Faculty Promotion Development Fund
2011	Award from CSUS Faculty Promotion Development Fund
2012	President, UEI Faculty Grant Award for professional development
2012	Award from CSUS Faculty Promotion Development Fund
2015	Pedagogy Enhancement Award

## Students supervised

2009–2010	Brandon Ausmus	Summer research (SURE award) and Senior project
2009–2010	Marcus Asaro	Summer research and Physics 199
2010	Nithin Dhanajayan	Physics 199 project for two semesters
2011–2012	Demetri Papamichalis	Senior project
2012–2013	James Potts	Senior project
2013	Brandon Bentley	Senior project
2014	Carlos Pereyra	Summer research (SURE award)
2015	Joshua Reinheimer	Summer research (SURE award) , physics 199, and senior project
2017-2019	Andrew Fruneaux	Summer research (SURE award) and Senior project

## List of Publications

### Refereed Journal Articles

- [1] “*Jellium Model of Metallic Nanocoheision.*”  
C. A. Stafford, D. Baeriswyl, and J. Bürki, Phys. Rev. Lett. **79**, 2863 (1997).
- [2] “*Cohesion and Conductance of Disordered Metallic Point Contacts.*”  
J. Bürki, C. A. Stafford, X. Zotos and D. Baeriswyl, Phys. Rev. B **60**, 5000 (1999); see also erratum in Phys. Rev. B **62**, 2956 (2000).
- [3] “*Comment on ‘Quantum Suppression of Shot Noise in Atom-Size Metallic Contacts’.*”  
J. Bürki and C. A. Stafford, Phys. Rev. Lett. **83**, 3342 (1999).
- [4] “*Universality in Metallic Nanocoheision: A Quantum Chaos Approach.*”  
C. A. Stafford, F. Kassubek, J. Bürki, and H. Grabert, Phys. Rev. Lett. **83**, 4836 (1999).
- [5] “*Comment on ‘Density Functional Simulation of a Breaking Nanowire’.*”  
C. A. Stafford, J. Bürki, and D. Baeriswyl, Phys. Rev. Lett. **84**, 2548 (2000).

- [6] “*Quantum Necking in Stressed Metallic Nanowires.*”  
J. Bürki, Raymond E. Goldstein, C. A. Stafford, Phys. Rev. Lett. **91**, 254501 (2003).
- [7] “*Jahn-Teller Distortions and the Supershell Effect in Metal Nanowires.*”  
D. F. Urban, J. Bürki, C.-H. Zhang, C. A. Stafford, and H. Grabert, Phys. Rev. Lett. **93**, 186403 (2004).
- [8] “*Electronic Shell Effects and the Stability of Alkali Nanowires.*”  
D. F. Urban, J. Bürki, A. I. Yanson, I. K. Yanson, C. A. Stafford, J. M. van Ruitenbeek and H. Grabert, Solid State Communications **131**, 609 (2004).
- [9] “*Stability of Metal Nanowires at Ultrahigh Current Densities.*”  
C.-H. Zhang, J. Bürki, C. A. Stafford, Phys. Rev. B **71**, 235404 (2005).
- [10] “*Theory of Metastability in Simple Metal Nanowires.*”  
J. Bürki, C. A. Stafford, D. L. Stein, Phys. Rev. Lett. **95**, 090601 (2005).
- [11] “*On the Stability and Structural Dynamics of Metal Nanowires.*”  
J. Bürki, C. A. Stafford, Appl. Phys. A **81**, 1519 (2005).
- [12] “*Comment on ‘Nonlinear current-voltage curves of gold quantum point contacts’ [Appl. Phys. Lett. 87, 103104 (2005)].*”  
J. Bürki, C. A. Stafford, D. L. Stein, Appl. Phys. Lett. **88**, 166101 (2006).
- [13] “*Stability and Symmetry Breaking in Metal Nanowires: The Nanoscale Free-electron Model.*”  
D. F. Urban, J. Bürki, C. A. Stafford, Hermann Grabert, Phys. Rev. B **74**, 245414 (2006).
- [14] “*Discrete thinning dynamics in a continuum model of metallic nanowires.*”  
J. Bürki, Phys. Rev. B **75**, 205435 (2007).
- [15] “*Electronic and atomic shell structure in aluminum nanowires.*”  
A. I. Mares, D. F. Urban, J. Bürki, H. Grabert, C. A. Stafford, and J. M. van Ruitenbeek, Nanotechnology **18**, 265403 (2007).
- [16] “*Front propagation into unstable metal nanowires.*”  
J. Bürki, Phys. Rev. E **76**, 026317 (2007).
- [17] “*The Order of Phase Transitions in Barrier Crossing.*”  
J. Bürki, C. A. Stafford, and D. L. Stein, Phys. Rev. E **77**, 061115 (2008).
- [18] “*Determining the Energy Barrier for Decay out of Superdeformed Bands.*”  
B. R. Barrett, J. Bürki, D. M. Cardamone, C. A. Stafford, D. L. Stein, Phys. Lett. B **688**, 110 (2010).
- [19] “*The Nanoscale Free-Electron Model.*”  
D. F. Urban, J. B. Bürki, C. A. Stafford, H. Grabert, in “Handbook of Nanophysics: Principles and Methods”, Edited by K. Sattler, Taylor & Francis (September 2010).
- [20] “*A Nano-Transistor Based on Gate-Induced Thermal Switching.*”  
J. Bürki, C. A. Stafford, and D. L. Stein, International Journal of Theoretical and Applied Nanotechnology **1**, 30–37 (2012).

- [21] “*Lifetimes of Metal Nanowires with Broken Axial Symmetry.*”  
L. Gong, J. Bürki, C. A. Stafford, and D. L. Stein, *Phys. Rev. B* **91**, 035401 (2015).
- [22] “*Monkeying Around in Mechanics: Using Student-Student Dialogue Videos to Increase Physics Learning.*”  
V. Margoniner, J. Bürki, and M. Kapp, *The Physics Teacher* **57**, 232 (2019).

### Conference Proceedings

- [23] “*Fractional Statistics in a One-Dimensional Quantum Model.*”  
J. Bürki, Diploma thesis, EPFL (1996).
- [24] “*Transport and Cohesive Properties of Metallic Nanocontacts: A Free-Electron Model.*”  
Thèse N° 1282, Université de Fribourg, Suisse (2000).
- [25] “*Cohesion, Conductance, and Charging Effects in a Metallic Nanocontact.*”  
C. A. Stafford, F. Kassubek, J. Bürki, H. Grabert, and D. Baeriswyl, in *Quantum Physics at the Mesoscopic Scale*, edited by D. C. Glattli and M. Sanquer (EDP Sciences, Les Ulis, France, 2000), pp. 49-53, and cond-mat/0210533.
- [26] “*Statistics of quantum transport in metal nanowires with surface disorder.*”  
J. Bürki and C. A. Stafford in *Electronic Correlations: from meso- to nano-physics*, edited by T. Martin, G. Montambaux, and J. Tran Thanh Van (EDP Sciences, Les Ulis, France, 2001), pp. 27-30, and cond-mat/0106244.
- [27] “*Fluctuational Instabilities of Alkali and Noble Metal Nanowires.*”  
J. Bürki, C. A. Stafford, and D. L. Stein, in *Noise in Complex Systems and Stochastic Dynamics II*, edited by Z. Gingl et al. (SPIE Proceedings, 2004), vol. 5471, pp. 367-379, and cond-mat/0406374.
- [28] “*Nonlinear Dynamics of Metallic Nanofabrication.*”  
J. Bürki, in “*Modeling and Simulating Materials Nanoworld*”, Edited by P. Vincenzini and F. Zerbetto (Advances in Science and Technology, Vol. 44, Techna Group Srl, Faenza, Italy, 2004), pp. 185-192, and cond-mat/0406349.
- [29] “*A nanoscale transistor based on gate-induced stochastic transitions.*”  
J. Bürki, C. A. Stafford, and D. L. Stein, in *Proceedings of the 3<sup>rd</sup> International Conference on Nanotechnology: Fundamentals and Applications*, ISBN 978-0-9867183-3-5 (2012).

### Papers Submitted, in Preparation, and Unpublished Papers

- [30] “*Proposal for a nanoscale variable resistor/electromechanical transistor.*”  
J. Bürki, C. A. Stafford, and D. L. Stein, arXiv:0807.1526, unpublished (2008).
- [31] “*Learning-Assistant-supported Active-Learning in a Large Classroom.*”  
V. Margoniner, J. Bürki, and M. Block, accepted for publication in *Am. J. Phys.* (2020).