###### Clemens Burda, Ph.D.

###### Professor of Chemistry,

###### Prof. of Materials Science and Engineering,

###### Professor of Macromolecular Science and Engineering,

###### Chemical Professor of the College of Arts and Science.

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Case Western Reserve University

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**Personal Statement**

# Prof. Burda aims to expand the frontiers of materials science and to provide a deeper understanding of the physical chemistry underlying functional nanomaterials. Active research areas are Photoscience with emphasis on Photomedicine, Materials Science with emphasis on Nanoscience, and Physical Chemistry specializing in Spectroscopy, aiming to develop novel bio- and energy materials.

# EDUCATION

2010 ***Visit. Prof.*** University of Toronto (*Two-dimensional electronic laser spectroscopy*)

(Host: G. D. Scholes, Physical Chemistry)

1998 ***PostDoc*** Georgia Institute of Technology (*Nanoscience and laser spectroscopy*)

(Supervisor: M. A. El-Sayed, Physical Chemistry)

1997 ***Ph.D.***  University of Basel (*Photochemistry and laser spectroscopy*), Switzerland

(Advisor: H.-J. Wirz, Physical Chemistry)

1994 ***Internship*** University of Basel (*Biochemistry)*, Switzerland

(Advisor: G. Schatz, Biochemistry)

1993 ***Diploma*** University of Basel (*ESR and ENDOR investigations of azulene radical*

*anions)*, Switzerland

(Advisor: F. Gerson, Physical Chemistry)

## APPOINTMENTS

2014-present ***Secondary Appointment***, Department of Macromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH

2012- **Chemical Professor of the College of Arts and Science**, Case Western Reserve University.

2011-present ***Professor***, Department of Chemistry, Case Western Reserve University, Cleveland, OH

2010 ***Visiting Professor***, Department of Chemistry, University of Toronto, ON, CANADA

2008-present ***Secondary Appointment***, Department of Materials Science and Engineering, Case Western Reserve University, Cleveland, OH

2006-2011 ***Associate Professor***, Department of Chemistry, Case Western Reserve

University, Cleveland, OH

* Nanostructured materials for photocatalytic, photovoltaic and

thermoelectric applications

* Nanoparticles for phototherapy and bioimaging applications

2001-2006 ***Assistant Professor***, Department of Chemistry, Case Western Reserve

University, Cleveland, OH

* Laser spectroscopic analytical techniques for studying nanomaterials
* Novel nanoparticles and nanocomposites for sensor applications

1998-2000 ***Associate Director***, Laser Dynamics Laboratory, School of Chemistry and

Biochemistry, Georgia Institute of Technology, Atlanta, GA

## PRINCIPAL ACTIVITIES

2005-2009 ***Director***, Analytical Core Facility for Inorganic Nanoparticles, Case Western Reserve University, Cleveland, OH

2003-present **Co-*Director***, Center for Chemical Dynamics (CCD), Case Western Reserve

University, Cleveland, OH

**AWARDS AND HONORS**

2015 Co-Organizer, Inter-American Photochemical Society (I-APS) Conference, Sarasota, FL

2015 Co-Organizer, ACS Physical Chemistry Meeting, Boston, MA.

2012 Session Chair at I-APS Conference, Ultrafast Photochemistry, Sarasota, FL.

2011 Gordon Conference Session Chair, Photochemistry, 2011.

2011 Invited for writing a REVIEW for Chem. Soc. Reviews

2011 Invited for writing a PERSPECTIVE for J. Phys. Chemistry Letters

2010 Invited for FEATURE ARTICLE for the Journal of Materials Chemistry

2010 Conference Co-Chair, Fluorescent Probes in Biophysics and Chemistry, ACS Spring Meeting, San Francisco, CA

2009 Publication chosen as FEATURE and COVER PAPER in Langmuir

2009 Publication selected as HOT PAPER in Angewandte Chemie

2008 Gerhard Closs Student Award - Inter-American Photochemical Society

(Best Ph.D. Thesis in Photosciences – Smita Dayal)

2008 Innovations in Photobiology Award, American Society for Photobiology

2007 Invited Feature Presentation at Gordon Research Conference for Photochemistry

2005 ACS Award for Most Accessed Article in 2005, 2006, 2007.

2005 Conference Co-Chair, Physical Chemistry of Interfaces and Nanomaterials IV, SPIE

2004 Faculty Member of the Case Comprehensive Cancer Center, University Hospitals, Cleveland, OH.

2004 Selected Panelist for National Academies of Science, Keck Futures Nano Conference

2004 Nominated for Wittke Award for Excellence in Undergraduate Teaching

2003 NSF-Career Award

2003 Glennan Fellowship Teaching Award

1997 DAAD Postdoctoral Fellowship

1997 Honors (Magna Cum Laude) for Ph.D. thesis at University of Basel, Switzerland

**PROFESSIONAL AFFILIATIONS**

1998-present Inter-American Photochemical Society

1996-present American Chemical Society

1995-present European Photochemical Society

**Over 180 peer-reviewed publications and H-Index of 60, cited over 20,000 times. Over 100 Invited Seminars given at Conferences, Universities and Industry Sites.**

**Book:**

**Burda, C.**; Ellingson, R. J.; Editors. Physical Chemistry of Interfaces and Nanomaterials IV. (Proceedings of the International Conference held 2-4 August 2005 in San Diego, California.) [In: Proc. SPIE-Int. Soc. Opt. Eng.; 2005, 5929].

**Book Chapters:**

Doane, T., Burda, C., Noncovalent Intracellular Drug Delivery of Hydrophobic Drugs on A NPs”, Springer Protocols, Methods in Molecular Biology 1025, Ed. Bergese, P.; Hamad-Schifferli, K., **2013**, 251-261.

Cheng, Y., **Burda, C.**, “Nanoparticles for Photodynamic Therapy”, Elsevier, London, 2010.

**Burda, C.**; Green, T.; Landes, C.; Link, S.; Little, R.; Petroski, J.; El-Sayed, M. A. “Optical Spectroscopy of Nanophase Material.” in *Characterization of Nanophase Materials*, Wiley-VCH, **2000**, 197-241.

**Book REVIEW:**

**Burda, C.** Metallic Nanomaterials. Edited by Challa S. S. R. Kumar. Journal of the American Chemical Society **2009**, 131(18), 6642.

**CONFERENCE Proceedings:**

Dayal S.; Krolicki R.; **Burda, C.\*** “Evaluation of Quantum Dots for Photodynamic Therapy.” *SPIE-Proceedings***,** (**2005**), 5705 (Nanobiophotonics and Biomedical Applications II), 247-254.

Gole, J. L.; **Burda, C.**; Fedorov, A.; Prokes, S. M. “Highly efficient formation of TiO2-xNx-based photocatalysts - potential applications for active sites in microreactors, sensors, and photovoltaics.” *Mater. Res. Soc. Symp. Proc.* (**2004**), 789, 311-315.

## TEACHING

2016/Spring Chem 305: Physical Chemistry Laboratory

2015/Fall Chem 304: Quantitative Analytical Chemistry Laboratory

2015/Spring Chem 305: Physical Chemistry Laboratory

2014/Fall Chem 304: Quantitative Analytical Chemistry Laboratory

2014/Spring Chem 305: Physical Chemistry Laboratory

2013/Fall Chem 304: Quantitative Analytical Chemistry Laboratory

2013/Summer Chem 397/398: Undergraduate Research

2013/Spring Chem 305: Physical Chemistry Laboratory

2013/Spring Chem 305: Physical Chemistry Laboratory

2012/Fall Chem 304: Quantitative Analytical Chemistry Laboratory

2012/Summer Chem 397/398: Undergraduate Research

2012/Spring Chem 305: Physical Chemistry Laboratory

2011/Fall Chem 304: Quantitative Analytical Chemistry Laboratory

2011/Summer Chem 397/398: Undergraduate Research

2011/Spring Chem 305: Physical Chemistry Laboratory

2010/Fall Chem 310/410 Instrumental Analysis

2010/Summer Chem 106: General Chemistry (3 Credit hours)

2010/Spring Sabbatical at Chemistry Department, Univ. of Toronto, CANADA

2009/Fall Chem 310/410: Instrumental Analysis

2009/Summer Chem 106: General Chemistry (3 Credit hours)

2009/Spring Lecture free due to double-load past fall

2008/Fall FSNA 118: Nanotechnology SAGES Seminar Series,

Chem 310/410 Instrumental Analysis

2008/Summer Chem 106: General Chemistry (3 Credit hours)

2008/Spring Chem 407: Graduate Level Thermodynamics and Statistical Mechanics

(3 Credit hours)

2007/Summer Chem 805: Advanced Chemistry by Inquiry IV (2 Credit hours)

2007/Spring Chem 336: Physical Chemistry II (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2006/Fall Chem 310/410: Instrumental Analytical Chemistry (3 Credit hours)

Chem 304: Quantitative Analytical Chemistry Laboratory (ancillary)

2006/Summer Chem 804: Advanced Chemistry by Inquiry III (2 Credit hours)

2006/Spring Chem 407: Graduate Level Thermodynamics and Statistical Mechanics

(3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2005/Fall Chem 310/410: Instrumental Analytical Chemistry (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2005/Summer Chem 803: Advanced Chemistry by Inquiry II (2 Credit hours)

2005/Spring Chem 450: Graduate Level Spectroscopy (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2004/Fall Chem 335: Physical Chemistry I for BS Chemistry Majors (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2004/Summer Chem 802: Advanced Chemistry by Inquiry I (2 Credit hours)

2004/Spring Chem 407: Graduate Level Thermodynamics and Statistical Mechanics (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2003/Fall Chem 335: Physical Chemistry I for BS Chemistry Majors (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2003/Summer Chem 801: Chemistry for High School Teachers I (2 Credit hours)

2003/Spring Chem 450: Graduate Level Spectroscopy (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2002/Spring Chem 665: Graduate Colloquium (1 Credit hour)

2001/Fall Chem 335: Physical Chemistry I for BS Chemistry Majors (3 Credit hours)

Chem 113: General Chemistry Laboratory (3 Credit hours)

2000/Summer Lecture Series: “Optical Properties of Semiconductor Nanoparticles” at Georgia

Institute of Technology, Atlanta, GA

**VISITING SCHOLARS HOSTED**

Dr. Lixia Sang Fall 2014-2015

Dr. Junbo Zhong Spring 2013 – December 2013

Dr. Jeff Dyck ( 2nd Sabbatical) Fall 2012 John Carroll University, Cleveland, OH

Dr. Jeff Dyck (Sabbatical) Fall 2007 John Carroll University, Cleveland, OH

Dr. Kyril Slontsev Summer 2005 Georgia Institute of Technology, Atlanta, GA

Dr. Kyril Slontsev Summer 2003 Georgia Institute of Technology, Atlanta, GA

Dr. Margozata Roszanowska Summer 2002 University of Cardiff, United Kingdom

## POSTDOCTORAL RESEARCHERS SUPERVISED

Dr. Gustavo Parra 2015-2016

Dr. Lily Wang 2013-2015

Dr. Junbo Zhong 2013-2014

Dr. Raj Seenivasan 2012-2013

Dr. Lixia Sang 2012-2013

Dr. Wenchao Sun 2012-2013

Dr. Chia-Pin Pan 2005-2006

Dr. Robert Krolicki 2003-2005

Dr. Ping Lu 2002-2002

Dr. Xiaoling He 2001-2002

## Ph.D. STUDENTS SUPERVISED

Wei-Chun Lin 2014-present

Christopher McCleese 2012-present

Anton Kovalsky 2012-present

Xin Guo 2014-2016

Keng-Chu Lin 2008-2013

Chi-Hung Chuang 2008-2013

Tennyson Doane 2008-2013

Baodong Mao 2007-2012

Junwei Li 2007-2012

Yu Cheng 2006-2011

Yixin Zhao, Ph.D. 2005-2010

Xiaofeng Qiu, Ph.D. 2004-2008

Smita Dayal, Ph.D. 2004-2008

Yongbing Lou, Ph.D. 2001-2006

Xiaobo Chen, Ph.D. 2001-2005

## M.S. STUDENTS SUPERVISED

Muyuan Zhao 2016-present

Yixiao Li 2014-2016

Xiao Qi 2013-2015

Lang Guo 2013-2015

**Ph.D. STUDENT AWARDS**

Chi-Hung Chuang: 2012 Nominated for Closs Award for Best U.S. Ph.D. in Photochemistry.

Yu Cheng: 2007 (ShowCase), 2008 (ShowCase), 2009 (ACS Meeting), 2010 (National ACS Meeting) Best Poster Awards

Smita Dayal: 2008 Closs Award for Best U.S. Ph.D. in Photochemistry

2007 Best Oral Presentation, Society for Applied Spectroscopy

2007 Outstanding Research Poster Award

2007 Outstanding Graduate Performance Merit Award

Xiaofeng Qiu: 2007 ShowCASE 1st Prize Poster Award

2007 Outstanding Graduate Performance Merit Award

Yongbing Lou: 2005 Outstanding Research Poster Award

2002 for Best Student Presentation at Regional ACS Meeting

Xiaobo Chen: 2005 Outstanding Graduate Performance Merit Award

2004 Outstanding Research Poster Award

**UNDERGRADUATE STUDENTS DIRECTLY SUPERVISED**

Yasha Duggal 2015-2017

William Littlefield 2015-2016

Daniel Kim 2016 S (Medical School)

Shriya Srinivasan 2013-2014 (now at Harvard)

Patrick Cosgrove 2014 S,F

Charles Kolodziej Fall 2013 (Ph.D. Chemistry)

Sang-Myung Lee 2013 S

Sandra Pejic 2013 S,F (Ph.D. Chemistry)

Sang-Ook Kim 2013 S

Michael Chiang 2013 S (Dental School)

Nicholas Capaldo 2013 S,F (Medical School)

Sandra Peijic 2012-2013 (Supervised Senior Capstone Project Chem 398)

Sang-Myung Lee 2012 F (Supervised Senior Capstone Project Chem 398)

David Se-Hoon Kim 2012 F (Supervised Senior Capstone Project Chem 398)

Nipun Sodhi 2012 S,F (Supervised Senior Capstone Project Chem 398)

Hoan Cheng 2012 S (Supervised Senior Capstone Project Chem 398)

Krishna Moparthi 2012 S (Supervised Senior Capstone Project Chem 398)

Jeff Cheng 2012 S (Supervised Research Chem 397)

Nathan Beals 2011-2012 (Supervised Senior Capstone Project Chem 398)

Cory Rusinek 2011-2012 (Supervised Senior Capstone Project Chem 398)

Ph.D. student Chemistry, Univ. of Cincinnati, OH.

Sagnik De 2011-2012 (Supervised Senior Capstone Project Chem 398)

Andrew Chomas 2009-2012 (Supervised Senior Capstone Project Chem 398)

Ph.D. student Chemistry, Univ. of Boulder, CO.

Amir Babar 2009-2011 (Supervised Senior Capstone Project Chem 398)

Minjeong Kim 2007-2010 (Pharmacology Ph.D., OSU)

Christopher Kimes 2005-2007 (MD-Ph.D. Student)

Erik Navok 2004-2007 (Duracell)

Jared Allred 2005-2006 (Ph.D. Chemistry)

Eric Giles 2004-2007 (Ph.D. Chemistry)

Jessica Mankus 2003-2006 (Lives in France)

Sarah Halasz 2003-2006 (Science Editor)

Joseph Casey Johnson 2003-2005 (Ph.D. Case)

Jonathan Wheeler 2002 (Supervised Senior Capstone Project)

Robert Immormino 2002 (M.D. Student at Duke)

**SERVICE**

**Extramural Academic Services:**

2014 Session Chair of “Ultrafast Photochemistry” at Inter-American Photochemical Society Meeting in Sarasota, FL, January, 2013.

2013 Chair of Photovoltaics Conference, at the International Semiconductor and Device Research Symposium, ISDRS 2013, Washington, Dec., 2013.

2013 Session Chair of “Ultrafast Photochemistry” at Inter-American Photochemical Society Meeting in Sarasota, FL, January, 2013.

2011 Chair of Photovoltaics Conference, at the International Semiconductor and Device Research Symposium, ISDRS 2011, Washington, Dec. 7-9, 2011.

2011 Chair of Materials Photochemistry Session, Gordon Research Conference of Photochemistry, 2011.

2010 Organizer and Co-Chair of the Conference “Fluorescent Probes in Biophysics and Chemistry”, ACS National Meeting, San Francisco, March 21-25, 2010.

2005 Organizer, Co-Chair, and Proceedings Editor of the 2005 Conference on “Physical Chemistry of Interfaces and Nanomaterials IV”, SPIE Meeting, San Diego, CA

1999 Co-organizer IUPAC Workshop on Advance Materials, Hong Kong, China

**University and Departmental Services:**

2013.06 Co-Organization of Nano-workshop in Hanoi -Vietnam

2012.12 Co-Organization of “Surface, Colloids, and Nanomaterials 2012 a Joint University of the Philippines – Case Western Reserve University Symposium”, University of the Philippines, Manila, Philippines, December, 2012.

2012-present Member, Steering Committee, SCSAM Center

2011 Introduced successfully a self-supporting Master’s class in Chemistry

2011 Revived successfully the recruiting of domestic students

2011 Rewrote and reorganized CHEM 304 and CHEM 305 Laboratory Courses

2009-present Member, Steering Committee, Institute for Advanced Materials

2003-present Member, Nanotechnology Steering Committee, CWRU

2002-2007 Chemistry Department Representative, NSF-MSP, CWRU

2009-present Chair, Graduate Admissions Committee, Chemistry Department

2008-present Member, Executive Committee, Chemistry Department

2008-2009 Member, Grad. Affairs Committee, Chemistry Department

2008-2012 Member, Resources Committee, Chemistry Department

2005-2009 Director, BRTT *Analytical Core Facility for Inorg. Nanomaterials*, CWRU

2004-present Member, CASE Comprehensive Cancer Center, CASE School of Medicine

2004-present Co-Founder, Cleveland NanoCrystals Inc. through CASE Technology Ventures

2003 Member, Graduate Studies Committee, Department of Chemistry, CWRU

2002-present Co-Director, Center for Chemical Dynamics (CCD), CWRU

2001-2008 Member, Undergraduate Recruiting Committee, Chemistry, CWRU

2001-2010 Research Advisor for 22 chemistry undergraduate and graduate students, CWRU

2001-present Academic advisor and mentor to numerous Case Undergraduate Students

**K-12 and Community Outreach in Cleveland:**

2003-present Outreach Spectroscopy Lectures/Shows to Cleveland High Schools

2003-present Talks in public libraries to children and parents on spectroscopy and nanoscience

2002-present Teaching & Course Development, Summer School for Cleveland High School

Teachers (NSF-MSP)

2002-present High School Visits and Lectures on Nanoscience and Chemistry

**Proposal Reviewer for:** NSF, ACS-PRF, DOE, DOD, NIH, Norwegian NSF, Canadian Foundation of Innovation, Singapore Science Foundation, etc.

**Study Sections/Panel Reviewer for:** NSF, NIH/NANO, Austrian NSF, DOE, etc.

**Editorial Review for Journals:**

*Associate Editor (since 2012): Materials for Renewable and Sustainable Energy (Springer)*

*Editorial Board* *Member* (since 2002): International Journal of Nanotechnology

*Proceedings Reviewer and guest editor*, SPIE-Optics and Photonics

*Reviewer* *for* Journal of the American Chemical Society, Nature, Journal of Physical Chemistry, Advanced Materials, Langmuir, Chemistry of Materials, Nano Letters, ACS NANO, Nanoscale, Analytical Chemistry, Inorganic Chemistry Communications, Advanced Interfaces & Materials, Langmuir, Journal of Luminescence, Photochemistry and Photobiology, Chemosphere, Angewandte Chemie Int. Ed., Small, etc.

**Research Support**

* NIH R01 (PI: James Basilion CWRU) 2016-2020
* NIH R01 (PI: AM Broome CWRU) 2010-2015
* NSF NIRT (PI: D. Dixon, Univ. of Alabama) 2007-2011
* NSF Career Award for the years 2003 – 2008
* ACS-PRF Award 2003-2005
* ACS-PRF 2006-2008
* Industry Consulting