



## Personal Details

---

Name                      Julia Baldauf  
Email                     [julia.s.baldauf@gmail.com](mailto:julia.s.baldauf@gmail.com)  
Phone                    0163 1378833

I am a physicist with a strong computer science background. Both, my masters and PhD were in experimental nano science and my latest project in computer science using neural nets. I also have professional experience in team leadership roles and strategic planning of projects. I am very passionate about working with a team and together driving positive and impactful project outcomes.

## Professional Experience

---

April 2017                      **Pollinate Energy**, Lucknow (IND)  
- May 2017                     Guest Program Leader

Pollinate Energy is a social enterprise with the aim to reduce poverty in urban poor India through the access to solar lights and fans. After volunteering for Pollinate Energy in 2016 I returned this time to help run the professional fellowship program with 12 participants. I was guiding the teams throughout their projects helping the company to further establish their business in Uttar Pradesh. Working in urban poor India was a challenging experience which helped me to further grow as a person.

July 2015                      **IBM Research Australia**, Melbourne (AUS)  
- November 2016             Staff Researcher

As a potential future leader of IBM Research Australia I was given a permanent position as a Staff Researcher. Restructuring of the Research Lab meant a stronger focus on healthcare, dissolving the natural resources efforts. I moved into the cognitive analytics team driving the agenda of deep learning in the healthcare and finance sectors. This involved upskilling to machine learning. I focused on neural networks and worked on semantic image labelling of optical coherence tomography data of arteries with stents. As a continuing member of the 'Invention Disclosure Team' team I helped to improve the labs innovative output and mentoring others.

July 2013                      **IBM Research Australia**, Melbourne (AUS)  
- June 2015                     Postdoctoral Research Scientist

I initially joined IBM Research Australia to work in the Bionanosensor team, setting up the experimental facilities and helping to develop the strategic plan of the project. However as this project moved back to IBM Research Yorktown I moved in the nanotechnology in natural resources team taking over the leadership of this team. Following this, I was enrolled in the IBM emerging talent program to help unfold my potential in this role. This team leadership role involved strategic planning across the Australia Research Lab, collaboration with global labs as well as working closely with clients. I successfully developed trustful relationships with clients by listening and understanding their needs and proposing research projects. This resulted in signing a 'Joint Study Agreement' with Metso to study the froth flotation process. I also contributed technically studying nanoscale systems with molecular dynamic simulations. During this period I was appointed a member of the 'Invention Disclosure Team' to help drive the labs innovation output.



February 2013      **University of Melbourne**, Melbourne (AUS)  
- April 2013      Research Assistant in Prof. Mulvaney's group

In my role as a research assistant I was responsible training new users in the techniques and application of various instruments which I built and developed during my time as a PhD student. It also involved knowledge transfer helping to formulate new research questions and projects.

February 2010      **University of Melbourne** - Melbourne, VIC, AUS  
- April 2012      Laborbetreuung von Studentenpraktika

January 2008      **Max-Planck Institute for Extraterrestrial Physics**, Munich (GER)  
- March 2008      Research Student in Dr. Predehl's group  
Testing X-Ray Detectors for the eROSITA project

June 2007      **University of Hawaii**, Honolulu (US)  
- September 2007      Research Project for Undergraduates in Prof. Kudritzki's group  
Analyzing spectra of supergiants to determine their metallicity

October 2006      **Walther Meissner Institute**, Munich (GER)  
- February 2007      Research Student in Prof. Hermann's group  
Designing a temperature controlled chamber for STM measurements

July 2006      **University of Southampton**, Southampton (UK)  
- September 2006      Research Student in Prof. Pavlos Lagoudakis's group  
Setting up a temperature dependent TCSPC set-up, measuring energy transfer from QDs to a quantum well

March 2005      **Max-Planck Institute for Plasma Physics**, Munich (GER)  
- April 2005      Research Student in Prof. Zohm's group  
Simulation and Analysis of the temperature profile in the Tokamak ASDEX

November 2002      **Siemens**, Munich (GER)  
- January 2005      Student Placement  
Testing work capacity of MOSFETs

July 2002      **Siemens**, Beeston (UK)  
- September 2002      Student Placement  
Translating a phone user interface

## **E d u c a t i o n**

---

June 2009      **PhD in Physics**, University of Melbourne, Melbourne (AUS)  
- February 2013      Nanoparticle Group (Prof. Mulvaney)

Thesis Title: **The effects of External Fields on the Optical Properties of Nanocrystals**. Excitonics and plasmonics are exciting fields in nano science due to the outstanding optical properties evolving in the nanometer scale of semiconductor and metal materials. This makes nanocrystals promising candidates for applications like for example LEDs, solar cells and bio labels, however their optical properties are not fully understood yet. In my thesis I focused on CdSe/CdS/ZnS and gold nanocrystals. In order to further understand their optical properties I constructed a widefield microscope where I was able to apply different atmospheres to the samples, showing there is a strong correlation between the atmosphere and the optical behaviour of nanocrystals. This was confirmed and further studied using a confocal microscope allowing single nanocrystal exciton lifetime measurements. Furthermore, I developed techniques to overlap widefield/darkfield images with atomic force microscope images and



scanning electron images to gain insights in the structural dependence on the optical properties. I also developed devices with which I was able to apply electric fields to single nanocrystals and ensembles in order to study charging effects on nanocrystals.

November 2002      **Master in Physics**, Ludwig-Maximilian's University, Munich (GER)  
- March 2009      Photonics and Optoelectronics Group (Prof. Feldmann)

Thesis Title: **Size dependent Luminescence of Semiconductor Nanocrystals**. Nano science creates a wealth of new materials, during my master degree I investigated size dependence on the optical properties of semiconductor tetrapods using a widefield setup with a cryostat sample chamber.

September 2005      **ERASMUS Scholar**, University of Seville, Seville (ESP)  
– March 2006      Coursework in Physics

## Professional Development

---

|                |   |
|----------------|---|
| August 2016    | JavaScript Basics – Udacity Course                                |
| August 2016    | Intro to HTML and CSS – Udacity Course                            |
| July 2016      | Web Development – Udacity Course                                  |
| June 2016      | Software Development Process - Udacity Course                     |
| October 2015   | Deep Learning Course  |
| July 2015      | Python Course – University of Melbourne                           |
| March 2015     | IBM Emerging Leaders – Leading High Performance                   |
| March 2015     | IBM Emerging Leaders – Strategy and Finance for Leaders           |
| October 2014   | IBM Emerging Leaders – Leading Relationship                       |
| August 2014    | MD Workshop – University of Melbourne                             |
| March 2014     | Leadership in a Project Team Environment -IBM                     |
| October 2013   | Creativity, Innovation and Change - Coursera Course               |
| September 2013 | Virology I – How viruses work - Coursera Course                   |
| August 2013    | Drug Discovery, Development & Commercialization - Coursera Course |
| July 2013      | Cell Biology - Coursera Course                                    |

## Publications & Patents

---

S. Rohrmoser, J. Baldauf, S. Sapra, A. Eychmüller, I. M. Watson, R. T. Harley and P. G. Lagoudakis  
*"Temperature Dependence of Exciton Transfer in Hybrid Quantum Well/Nanocrystal Heterostructures"*,  
Applied Physics Letters 91 (2007)

C. Mauser, E. Da Como, J. Baldauf, A. L. Rogach, J. Huang, D. V. Talapin, and J. Feldmann  
*"Spatio-temporal dynamics of coupled electrons and holes in nanosize CdSe-CdS semiconductor tetrapods"* Physical Review B 82 (2010) (Selected for the Virtual Journal of Nanoscale Science and Technology 22 (2010) and the Virtual Journal of Ultrafast Science 9 (2010))

B. Mashford, J. Baldauf, T. Nguyen, A. Funston and P. Mulvaney  
*"Synthesis of Quantum Dot Doped Chalcogenide Glasses – via Sol-gel Processing"*  
Journal of Applied Physics 109 (2011)

Antonello, E. Della Gaspera, J. Baldauf, G. Mattei and A. Martucci  
*"Improved thermal stability of Au nanorods by use of photosensitive layered titanates for gas sensing application"* Journal of Materials Chemistry (2011)

E. Della Gaspera, M. Karg, J. Baldauf, J. Jasieniak, G. Maggioni and A. Martucci,  
*"Au Nanoparticle Monolayers Covered with Sol Gel Oxide Thin Films: Optical and Morphological Study"* Langmuir (2011)





S. Barrow, X. Wei, J. Baldauf, A. Funston, and P. Mulvaney

*"The Self-Assembly and Plasmon Modes of Three dimensional Gold Tetramers, Pentamers and Hexamers"* Nature Communications 3 (2012)

S. Murphy, K. Boldt, J. Baldauf and P. Mulvaney

*"Effect of different atmosphere on the QD luminescence"* Submitted to Nano Letters

J. Baldauf, C. Schieber and S. Harrer

*"Directed surface functionalization on selected surface areas of topographical features with nanometer resolution"* 10/15/2013 filed as Docket YOR920130807US1 in US

J. Baldauf, C. Schieber and S. Harrer

*"Nano fluidic sensor comprising spatially separated functional sensing components"*  
10/15/2013 filed as Docket YOR920130891US1 in US

J. Baldauf, C. Schieber, S. Harrer and J. Wagner

*"Tunable piezo-driven sieve consisting of a multi-nanopore chip"* 08/07/2014 published in IBM Technical Disclosure Bulletin

J. Baldauf, M. Downton, N. Gunn, S. Harrer, S. Kannam, C. Schieber, J. Wagner

*"Detection of translocation event using grapheme-based nanopore assemblies"* 06/26/2014 filed as Docket YOR920140181US1 in US

J. Baldauf, A. Bojovschi, and S. Moore

*"Engulfed nano/micro bubbles for improved recovery of large particles in a flotation cell"* 07/14/2015 filed as Docket YOR920140437US1 in US

J. Baldauf, C. Schieber, P. Rogers, A. Bojovschi, and S. Moore

*"Nanobubbles for enhanced interaction between solids and gas volumes"* 08/10/2015 filed as Docket YOR920150002US1 in US

J. Baldauf, D. Beurle, M. Downton, S. Moore, C. Schieber, G. Yiapanis

*"Flowfield sensors for monitoring liquid flow"* 09/07/2015 filed as Docket YOR920150333US1 in US

J. Baldauf, C. Schieber, A. Bojovschi, B. Mashford, G. Yiapanis, M. Downton

*"Froth flotation with anisotropic particle collectors"* 12/22/2015 filed as Docket YOR920151300US1 in US

J. Baldauf, A. Makarucha, M. Downton and G. Yiapanis

*"Fullerene-fullerene interactions in water: A molecular dynamic study"* J. Phys. Chem. C 120 (2016)

G. Yiapanis, A. Makarucha, J. Baldauf and M. Downton

*"Fullerenes and their hydrophobic characteristics: A molecular dynamics study"* Nanoscale 47 (2016)

J. Baldauf, B. Mashford, A. Makarucha

*"Real-time detection of emergency situations via cognitive analysis of audio data streams"*  
01/11/2016 published in IBM Technical Disclosure Bulletin

J. Baldauf, A. Bojovschi, B. Mashford, G. Yiapanis, A. Makarucha

*"A system and method for gold deposit identification"* 02/11/2016 published in IBM Technical Disclosure Bulletin

J. Baldauf, B. Mashford, J. De Hoog, K. Abdulla

*"Optimal distributed energy resource management system"* 07/28/2016 filed as Docket YOR920160837US1 in US



J. Baldauf, L. Ghahremanlou, F. Jalali, M. Salehi

*"System, method and computer program product for ensemble-based cognitive online health system for effective disease diagnosis"* 08/31/2016 filed as Docket YOR920161175US1 in US

J. Baldauf, F. Jalali, B. Mashford, M. Salehi

*"User-Friendly navigation system"* 03/05/2017 filed as Docket YOR920161808US1 in US

J. Baldauf, D. Beurle, M. Downton, K. Halupka, S. Moore, C. Schieber

*"Intravascular catheter for modeling blood vessels"* 05/10/2017 filed as Docket YOR920161273US1 in US

J. Baldauf, D. Beurle, M. Downton, K. Halupka, S. Moore, C. Schieber

*"Intravascular catheter including markers"* 05/20/2017 filed as Docket YOR920161274US1 in US

## **Awards & Scholarships**

---

|                |   |
|----------------|---|
| July 2016      | Professional Fellowship with Pollinate Energy   |
| May 2016       | IBM High Value Patent Application Award   |
| March 2016     | IBM Third Patent Plateau Award  |
| August 2015    | IBM Second Patent Plateau Award   |
| June 2014      | IBM First Patent Plateau Award  |
| March 2014     | IBM Emerging Talent Program   |
| April 2013     | 'Most Valuable Player Beachvolleyball Season 2012/13' Vicbeach  |
| June 2012      | Australian Nanotechnology Network (ANN) Young Nanoscience Ambassador Award                              |
| June 2011      | University of Melbourne Overseas Research Experience Scholarship  |
| June 2009      | University of Melbourne International Postgraduate Research Scholarship and Science Faculty Scholarship |
| May 2007       | German Academic Exchange Service (DAAD) Travel Scholarship  |
| May 2007       | Research Experiences for Undergraduates (REU) Scholarship   |
| September 2005 | ERASMUS Travel Scholarship  |
| April 2004     | Wilhelm and Else Hereaus Foundation Travel Award  |
| October 2002   | Siemens Young Ladies of Technology Network Member (YOLANTE)   |
| - March 2009   |   |

## **Volunteer & Representative Work**

---

|                         |  |
|-------------------------|--|
| October 2016            | Young Professional Fellow at Pollinate Energy in India             |
| September 2016          | Organised IBM Research's involvement at EXITE Camp                 |
| July 2016               | Joined VR Hackathon on urban sustainability in Melbourne           |
| January 2016            | Volunteer for "ICT in schools" program                             |
| October 2015            | Helped organising a 'Second to give' fundraiser event              |
| September 2015          | Organised IBM Research's involvement at the EXITE Camp             |
| April 2015              | Volunteer in Nepal for Journey to Nepal Organisation               |
| May2014/May 2015        | Volunteer for Foundation of Young Australians                      |
| September 2014          | Presented at the IBM EXITE Camp                                    |
| November 2013           | Volunteer for Residential Indigenous Science Experience            |
| 2013 – 2015             | Committee Member of IBM Research Australia's Social Club           |
| June 2011               | Volunteer at BIO21 Open Day (Nanotechnology Stand)                 |
| October 2011 - 2013     | Volunteer for "Scientist in Schools Program" of CSIRO              |
| September 2011          | Organizer of a Careers Expo for undergraduate students             |
| April 2011 - April 2012 | President - Chemistry Postgraduate Society                         |
| October 2010            | Postgraduate Student Representative at School of Chemistry Retreat |
| August 2010             | Volunteer at Open Day of the University of Melbourne               |



|                          |   |
|--------------------------|---|
| August 2010              | Representative at Nanotechnology stand at Herald Sun Home and Garden Expo |
| June 2010                | Postgraduate Student Representative at School of Chemistry Planning Day   |
| Since May 2010           | Australian Nanotechnology Network Member                                  |
| April 2010 - April 2011  | Treasurer - Chemistry Postgraduate Society                                |
| August 2009 - April 2012 | Chemistry Postgraduate Society Member                                     |
| Since February 2007      | Deutsche Physikalische Gesellschaft Member                                |

## **Skill Set**

---

**Computational:** Python, C++, Bash, Machine Learning (Tensorflow), Molecular Dynamics Simulations (Lammps, Colvars), VMD, Computational Fluid Dynamics (OpenFOAM), Software (Igor, Latex, Labview, Open Office Programs, Lotus Notes, Adobe Illustrator, Github), Operating Systems (Mac, Linux, Windows), Google App Engine, HTML, CSS, JavaScript

**Experimental:** Scanning Electron Microscopy, Focused Ion Beam Etching, Metal and Semiconductor Nanocrystal Synthesis, Sol-gel Processing, Thermal Evaporation, Sputter Coater, Photo-lithography, Clean Room Procedures, Glovebox/Schlenkline Procedures, Atomic Force Microscopy, Zeta-Potential Analyzer, I-V/FET Measurements, Absorption/Fluorescent Spectroscopy, Lifetime Measurements (Streak Camera, TCSPC, Pump-Probe, Flashphotolysis), Widefield Spectroscopy, Confocal & Darkfield Single Particle Spectroscopy, Cryostat Procedures

### **Interpersonal Skills:**

- Establishing and managing collaborative research projects with an aim to build synergies
- Excellent communication skills (thesis, scientific journals and presentations)
- Hands-on experience in teaching, demonstrating to others, mentoring and public speaking
- Managing multiple tasks concurrently
- Working independently or within a team, including interdisciplinary collaborations
- Fast learning and aptitude
- Ability to develop excellent working relationships with a diverse range of people
- Passion for ongoing learning and a strong belief in always applying myself to my personal best
- Self-motivated with enthusiasm and energy to achieve career goals
- Logical, dynamic, entrepreneurial thinker with strong analytical and research skills
- Excellent problem solving skills due to a holistic and provident thinking approach
- Managing projects according to time, budget and performance
- Optimistic attitude towards life in general
- Taking initiative in creating a social atmosphere at work to enable high performing teams
- Respecting diverse opinions and seeking to understand other peoples motivations

## **Languages**

---

German (native), English (fluent), Spanish (good), French (basic)

## **Other Interests**

---

Rock climbing, Beach volleyball, Mountaineering, Yoga, Reading, Traveling, Sustainable Living, Gardening



## **Referees**

---

Prof. Paul Mulvaney, Group Leader - Nanoparticle Group University of Melbourne  
2/30 Flemington Road, Parkville VIC 3010, +61-3-8344-2405, [mulvaney@unimelb.edu.au](mailto:mulvaney@unimelb.edu.au)

Dr. Juerg van Kaenel, Associate Director of IBM Research Australia  
5/204 Lygon Street, Carlton VIC 3053, +61-2-, [jvk@au1.ibm.com](mailto:jvk@au1.ibm.com)

Additional references available on request.