

# Dr. rer. nat. Christoph Andreas Steier

## Curriculum Vitae (October 2015)

---

### General Information:

- Home Address 2340 Carquinez Avenue, El Cerrito, CA 94530, USA, Phone: (510) 235-0855
- Work Address Lawrence Berkeley National Laboratory, 1 Cyclotron Road, MS 15R0217, Berkeley, CA 94720-8229, USA, Phone: (510) 495-2992, FAX: (510) 495-2030, e-mail: CSteier@lbl.gov
- Present Position Staff Scientist in the Accelerator Technology and Applied Physics Division at Lawrence Berkeley National Laboratory, deputy group leader of the Advanced Light Source (ALS) Accelerator Physics Group.
- Activity Description Research in accelerator physics with emphasis on electron storage rings. Focus in nonlinear single particle dynamics, lattice design, beam stability, insertion device effects, and ultra low emittance rings.
- Languages: English, German, French, Latin

---

### Education:

- 1999: Obtained the degree ‘Dr. rer. nat.’ (equivalent to PhD) *summa cum laude* from the Rheinische-Friedrich-Wilhelms Universität in Bonn (Bonn University, Germany); title of the PhD thesis: ‘Polarisierte Elektronen in der Elektronen-Stretcher-Anlage ELSA’ (Polarized Electrons in the Electron Stretcher Accelerator ELSA)
- 1996–1998: Scholarship of the ‘Graduiertenkolleg’ titled ‘Die Erforschung subnuklearer Strukturen der Materie’ (subnuclear structure of matter) of the DFG (German Research Foundation)
- 1995: Obtained the degree ‘Diplom-Physiker’ (mostly equivalent to Master of Science) from Bonn University; title of the diploma thesis: ‘Theoretische und experimentelle Untersuchungen zu Vielteilcheneffekten bei der Elektronen-Stretcher-Anlage ELSA’ (Theoretical and experimental studies concerning collective phenomena at the Electron Stretcher Accelerator ELSA)
- 1994: Passed the ‘Diplom-Prüfung’ in physics
- 1992: Passed the ‘Diplom-Vorprüfung’ in physics (roughly equivalent to Bachelor of Science)
- 1990: Finished German ‘Abitur’ (high school diploma) with highest possible grade of 1.0 at Humboldt Gymnasium, Düsseldorf

---

## Professional Career:

- since 2006: Deputy to the Advanced Light Source (ALS) Division Deputy for Operations and Accelerator Development at the Ernest Orlando Lawrence Berkeley National Laboratory (LBNL)
- since 2003: Lecturer in the Nuclear Engineering Department of University of California (UC) Berkeley
- since 2003: Deputy group leader of the accelerator physics group at the ALS at LBNL
- since 2002: Staff Scientist in the Accelerator and Fusion Research Division (AFRD), later renamed Accelerator Technology and Applied Physics Division (ATAP) at LBNL
- 1999–2002: Scientist in AFRD at LBNL
- 1996–1999: Research Assistant, ELSA Accelerator Group, Physics Institute, Bonn University
- 1995: Student Assistant, ELSA Accelerator Group, Physics Institute, Bonn University
- 1991–1994: Technical Student, ELSA Accelerator Controls Group, Physics Institute, Bonn University

---

## Summary of Research Activities (reverse chronological order)

1999–Today Lawrence Berkeley National Laboratory, ALS Accelerator Physics Group

The central area of my expertise is the linear and nonlinear transverse single particle dynamics:

- Work includes both experimental (e.g. first measurements of frequency maps) and theoretical aspects - mostly numerically (in some cases with code that I implemented myself).
- Result is significant improvement in the understanding of the dynamic momentum aperture in light sources.
- Studied the effects of insertion devices and especially elliptically polarizing undulators including successful correction of dynamic multipole effects.
- Improved methods for lattice optimization, including the quantitative use of diffusion rates as a merit function for lattice quality as well as the use of multi objective genetic algorithms for simultaneous linear and nonlinear lattice optimization.

Leader or manager of several small to midsize projects at the ALS (5-40 people involved) and cooperated in several international collaborations (including the Next Linear Collider and the International Linear Collider):

- Currently leading pre-conceptual design efforts towards diffraction limited storage rings, in particular a potential DLSR upgrade of the ALS, which is at the leading edge of the push towards ultra small emittances. Principal investigator for the R+D effort, covering technical areas including vacuum, injection, RF, lattice design, beamline optics, magnets, physics design optimization, and radiation production.
- Served as project leader of the ALS brightness upgrade, which reduced the natural emittance of the ALS by two thirds by the addition of harmonic sextupoles and needed to solve many challenges to avoid reducing the dynamic and momentum aperture. Also coordinated accelerator physics aspects and commissioning. Successfully completed to improve ALS brightness by factor of three.
- Project manager for the top-off upgrade of the ALS, which enabled a more than one order of magnitude improvement of the brightness of the ALS, as well as better beam stability. The top-off project was a very challenging project in terms of the accelerator physics aspects of its safety analysis, as well as many electrical engineering aspects. In addition to being the project manager, I also effectively managed the accelerator physics, safety, and electrical engineering aspects.
- Responsible for all accelerator physics and insertion device related issues of the upgrade of the femtosecond-slicing source at the ALS, an advanced source of ultrashort x-rays proposed by Zholents and Zolotarev at LBNL, which enables time resolved structure analysis on the fs time scale using x-rays. Challenges solved included local coupling and dispersion control, beam lifetime with non-symmetric lattices, small vertical aperture insertion devices, and wiggler field roll-off.
- Lead physicist of the Superbend project at the ALS, which presented many nonlinear dynamics challenges. The result was called ‘truly revolutionary’ in the report of a review of the ALS by the Office of Basic Energy Sciences of the the U.S. Department of Energy. Research carried out on the beamlines enabled by this project has contributed to 3 Nobel prizes related to protein crystallography during the past decade.
- Responsible for many years for scheduling all accelerator physics studies at the ALS as well as for coordinating extended commissioning periods.

Participated in several non ALS projects, both at LBNL and at SLAC:

- Commissioning of PEP-II, a joint LBNL, LLNL and SLAC project located at SLAC in Stanford extending to ongoing support for further optimization over almost 10 years (lattice correction, beam-based alignment, electron cloud, orbit correction, feedbacks). Heavily involved in the commissioning of SPEAR-III at Stanford (initial stored beam, lattice correction, nonlinear dynamics characterization, beam-based alignment, BPM system, beam diagnostics).
- Responsible for studies of the tail evolution and possible collimation schemes as part of the conceptual design effort for a Next generation Light Source at LBNL. Upgraded the AT simulation code to handle linacs.

Another major area I have worked on is orbit and beamsize stability. The work has resulted in many improvements, making the ALS one of the best performing light sources in the world:

- Designed and optimized slow and fast feedback and feedforward systems. Used beam-based measurement techniques to identify the source of many disturbances to beam stability. Investigated and improved long term beam energy stability (orbit feedbacks, spin dynamics, resonant depolarization, energy calibration).
- Noise reduction efforts for infrared beamlines at the ALS, as well as improvements in orbit and beamsize stability when switching polarization of EPU's, enabling world leading energy resolution in magnetic dichroism studies.
- Participation in Coherent Synchrotron Radiation Studies (bursting instabilities). Participation in design studies for coherent infrared synchrotron radiation source (CIRCE).
- As part of fs-slicing project, studied the limitations and improved the methods of coupling correction at the ALS. This work resulted in a world record for the smallest vertical emittance (4 pm rad) achieved in an electron storage ring at that time (2003). Originally a generic accelerator physics study, this later on allowed a significant brightness increase at the ALS, after the top-off upgrade was completed.

- Coordinated the beam dynamics studies at these very high beam densities, namely intra beam scattering (IBS) and Touschek lifetime studies. IBS could have been a significant performance limitation for a Next Linear Collider. Led a collaboration (including about 10 other physicists) between LBNL and SLAC to study IBS effects both in simulations and experiments at the ALS.
- Studied Touschek lifetime at the onset of a new regime, where the lifetime increases with reduced horizontal emittance, and where no measurements existed before our work.

Based on my extensive experience with accelerator control systems, including real time programming, I have in the past served as coordinator between the physics group and the operations and controls groups of the ALS.

- Coded substantial fraction of high level operations software at ALS (orbit feedback, top-off software, tune feedback, bunch equalizer, tune and beta beating correction, coupling correction, feed-forward table generation, lattice symmetrization, ...).
- Consultant for the ALS control system upgrade and ALS timing system upgrade.
- Supported digital controls development of booster power supply controllers. Coordinated tuning of compensation loops of power supplies to improve output stability. Algorithm development for ALS water cooling systems resulting in order of magnitude improvement in temperature stability (to the 0.01 degree C level).
- Responsible for the design and implementation of the fast ( $>1$  kHz) orbit feedback system at the ALS, which is a fairly complex digital feedback system (about 90 input and about 50 output parameters distributed on 12 computer crates). It was the first combined fast and slow orbit feedback system that did not rely on decoupling the frequency response of the system, but rather allowed the fast system to have full gain down to DC. This enabled a much improved correction of insertion device induced orbit errors compared to earlier fast feedback systems elsewhere.

1995–1999 Bonn University, ELSA Accelerator Group, PhD Student

- Worked on the study and correction of depolarizing resonances in ELSA. Together with a diploma student whom I supervised, I designed and implemented a pulsed tune jump quadrupole system, implemented upgrades in the orbit correction system and coordinated all of the measurements and corrections. To study the influence of synchrotron radiation on the crossing of depolarizing resonances, an effect for which no appropriate simulation codes were available, I implemented a new spintracking code.
- 1996–1999 Bonn University - DESY Collaboration  
Worked in close cooperation with another PhD student from Bonn in a collaboration with DESY on a feasibility study of electron cooling of high energy hadron beams (PETRA and HERA). Work included the conceptual design of an electron damping ring as well as calculations of the electron cooling process.
- 1994–1995 Bonn University, ELSA Accelerator Group, Diploma Student  
Studied ion trapping effects at ELSA, especially coherent (two-stream) instabilities between the ions and the electron beam. Carried out many measurements, led the installation of clearing electrodes as well as a beam shaking system and optimized the operational parameters to minimize the impact of ion trapping on the accelerator performance. Implemented a new simulation tool to quantitatively study the effects of ion trapping. Simulated and reduced the impedance of several legacy components in the ELSA vacuum system. Collaborated with the Forschungszentrum Karlsruhe and Mainz University, to apply my work on ion trapping to the accelerators ANKA (a synchrotron light source in Karlsruhe) and MAMI (a microtron for nuclear physics experiments in Mainz).
- 1991–1994 Bonn University, ELSA Accelerator Group, Technical Student  
In addition to my normal studies at the university, I worked as a technical student in the controls group of ELSA. I coded real time software essential for power supply ramping and the timing system enabling the post acceleration mode of ELSA.

---

## Project Responsibilities

- since 2013: Principal Investigator of the R+D effort towards a soft x-ray diffraction limited light source upgrade at Lawrence Berkeley National Laboratory (LBNL)
- 2011–2013: Responsible for tail management and collimation for the Next Generation Light Source (NGLS) Conceptual Design Study at LBNL
- 2009–2013: Project leader of the low emittance/sextupole upgrade (\$6M project) of the Advanced Light Source (ALS) at LBNL
- 2006–2008: Project Scientist responsible for accelerator physics and insertion device issues for the MERLIN beamline at the ALS
- 2005–2006: Member of the PEP-II optics and lattice task force for the asymmetric B-factory PEP-II at the Stanford Linear Accelerator Center (SLAC)
- 2004–2009: Project Manager of the top-off upgrade (\$5M project) of the ALS at LBNL

- 2003–2004: Participation in the commissioning of the 3rd generation light source SPEAR-III at SLAC, as part of an official ALS/SPEAR collaboration
- 2003–2004: Member of the PEP-II mid project evaluation lattice and optics group at SLAC
- 2002–2007: Project Scientist responsible for accelerator physics and insertion device issues for the upgrade of the femtosecond-slicing source at the ALS (about 25 people were working on this research effort)
- 2000–2001: Lead Physicist of the Superbend Project (about 40 people were working on this project) at the ALS, responsible for all accelerator physics issues and commissioning
- 1999–2000: Project Leader for the implementation of fast feedforwards on the elliptically polarizing undulators (EPU) at the ALS (involving about 10 physicists, software engineers, mechanical engineers and electrical engineers)
- 1998–2001: Participation in the commissioning of the B-factory PEP-II at SLAC, a joint project of LBNL, Lawrence Livermore National Laboratory (LLNL), and SLAC
- 1996–1999: Participation in a collaboration with DESY (Hamburg, Germany) to explore the possibilities of electron cooling of hadron beams at high energies (PETRA, HERA)

---

## Awards and Official Acknowledgements

- Sep 2015 LBNL Directors 2015 Exceptional Achievement Award for the ALS Brightness Upgrade (Project Leader)
- Oct 2009 Halbach Award for Instrumentation at the Advanced Light Source as part of the Top-Off Upgrade Project (Project Manager)
- Oct 2001 Halbach Award for Instrumentation at the Advanced Light Source as part of the Superbend Project Team (Lead Physicist)
- Oct 2001 LBNL Outstanding Performance Award
- Mar 2001 LBNL Outstanding Performance Award
- 1999–2003 Five LBNL SPOT Recognition Awards

---

## Grants

- 2016 \$400k DOE-BES - On-axis Injection (Principal Investigator)
- 2015 \$1.1M LDRD - Novel Accelerator Techniques for Diffraction Limited Light Sources (Principal Investigator)
- 2015 \$400k DOE-BES - On-axis Injection (Principal Investigator)
- 2014 \$1.15M LDRD - Novel Accelerator Techniques for Diffraction Limited Light Sources (Principal Investigator)
- 2013 \$750k LDRD - Novel Accelerator Techniques for Diffraction Limited Light Sources (Principal Investigator)
- 2009 \$5.8M ARRA - ALS Brightness Upgrade (Project Leader)
- 2004 \$4.9M AIP - ALS Top-off Upgrade (Project Manager)
- 1999–2004 Several small scale AIP awards  $\leq$  \$100k (Project Leader)

1997 DM500k European Union Funding - Tunejump quadrupole magnets + pulsers (Project Leader)

---

### Membership in standing Advisory Committees

- since 2010: Advanced Photon Source Upgrade (APS-U) Accelerator Physics Advisory Committee at Argonne National Laboratory (chair 2010-2014), since 2015 APS/APS-U Machine Advorsy Committee.
- 2009–2015: Member (and at times acting chair) of the Canadian Light Source (CLS) Machine Advisory Committee at University of Saskatoon.
- 2007–2010: Member of the National Synchrotron Light Source-II (NSLS-II) Accelerator Systems Advisory Committee at Brookhaven National Laboratory (BNL), followed in 2010-2011 by the Radiation Safety Advisory Committee (for top-off safety review) and in 2012 as chair for an Insertion Device Review for NEXT (\$90M project for six NSLS-II beamlines).
- 2007–2012: Member of the Center for Advanced Micro Devices (CAMD) Machine Advisory Committee at Lousiana State University (LSU) in Baton Rouge.
- since 2006: Member of the ALS Staff Safety Committee (ALSSC), a standing committee directly advising the director of the ALS on all safety related issues ; since 2010, chair of the radiation safety committee of the ALS.

---

### Teaching Experience

- Since 2003 Taught accelerator physics graduate classes at the US Particle Accelerator School at UC Santa Barbara in 2003, at Arizona State University in 2006, at University of Maryland in 2008, at Michigan State University in 2012, and at Rutgers University in 2015.
- Since 2003 Every fall semester since 2003 (since 2009 bi-annually), I have been teaching a graduate course in accelerator technology together with one or two colleagues in the nuclear engineering department of UC Berkeley.
- 2001–2009 Supervised three Postdocs at LBNL during 2001-2002, 2004-2005 and 2007-2009, as well as a scientific engineering associate since 2001.
- 1998–1999 Supervised one diploma student during his thesis in 1998/1999 in ELSA Accelerator Group at Bonn University.
- 1998 At Bonn University I taught small parts of a lecture series about general accelerator physics during two semesters (guest lecturer).
- 1996–1997 In addition I gave classes accompanying the regular lectures in Physics I+II to a group of about 20 students during two semesters (equivalent to teaching assistant).
- 1996–1998 Supervised several technical students (computer science) in 1996-1998.

---

### Professional Activities and Scientific Community Service

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Refereeing         | I am serving as referee for several scientific journals, including Phys. Rev. Lett., Phys. Rev. E, Phys. Rev. ST AB, Nucl. Instr. & Meth. A, Journal of Synchrotron Radiation, and the Journal of Physics. I have served as a reviewer for the Department of Energy SBIR/STTR program in 2006, 2007, 2008, and 2015, and the DOE young investigator program in 2014.                                                                                                                                                                                                                                                                                                    |
| Program Committees | I was a member of the program committee for the Particle Accelerator Conference 2003 and 2016, as well as the Scientific Advisory Board for IPAC 2012 and IPAC 2013. I was a member of local organizing committees for multiple workshops.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Reviews            | I have served on many review committees for major scientific facilities including LUX at LBNL, SPEAR-III upgrades and the FACET project at SLAC, the Shanghai Light Source, the Australian Synchrotron Project, NSLS-II, LCLS-II, and APS-U. I am a member of the Machine Advisory Committee for the CLS at a University of Saskatoon, and the APS-U at Argonne, and was from 2007-2010 a member of the Accelerator Systems Advisory Committee for NSLS-II at BNL and from 2007-2012 of the Machine Advisory Committee for CAMD at LSU. I also served on many Lehman review committees (CD-1 through CD-4) since 2007, including for NSLS-II, APS-U, LCLS-II, and NEXT. |
| Societies          | I am a member of both the American Physical Society (APS) and the German Physical Society (DPG).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Outreach           | I am also active in many outreach activities at the ALS, as well as Open House activities at LBNL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

---

## Selected Publications

Author or co-author of more than 30 publications in refereed journals, over 100 contributions in conference proceedings and over 50 other reports and articles. Presented over 50 invited talks world wide and has given many lectures at UC Berkeley as well as at several other US Universities as part of the US Particle Accelerator School. Complete publication list is available upon request.

**C. Steier**, *Possibilities for a Diffraction-Limited Upgrade of a Soft X-ray Light Source*, Synchrotron Radiation News, Volume 27, Issue 6, 2014, doi:10.1080/08940886.2014.97093

**C. Steier** et al., *Completion of the Brightness Upgrade of the ALS*, 2014 J. Phys.: Conf. Ser. 493 012030 doi:10.1088/1742-6596/493/1/012030

In A. Chao, et al., Handbook of Accelerator Physics and Engineering, 2nd edition, **C. Steier**, *Chapter on low emittance light source lattice design*, p 81, World Scientific New Jersey, May 2013, ISBN: 978-981-4415-84-2

M. Hertlein, A. Scholl, A. Cordones, J. Lee, K. Engelhorn, T. Glover, B. Barbrel, C. Sun, **C. Steier**, G. Portmann and D. Robin, *X-rays only when you want them: optimized pump-probe experiments using pseudo-single-bunch operation*, J. Synchrotron Rad. 22, 729-735 (2015)

C. Sun, D. S. Robin, H. Nishimura, **C. Steier**, and W. Wan, *Small-emittance and low-beta lattice designs and optimizations*, Phys. Rev. ST Accel. Beams 15, 054001 (2012)

M. Bei, M. Borland, Y. Cai, P. Elleaume, R. Gerig, K. Harkay, L. Emery, A. Hutton, R. Hettel, R. Nagaoka, D. Robin, **C. Steier**, *The Potential of an Ultimate Storage Ring for Future Light Sources*, Nucl. Inst. & Meth. A, 622, 3 (2010) 518-535, doi:10.1016/j.nima.2010.01.045

**C. Steier**, A. Madur, H. Nishimura, D. Robin, F. Sannibale, C. Sun, W. Wan, L. Yang, *Lattice and Emittance Optimization Techniques and the ALS Brightness Upgrade*, Nucl. Inst. & Meth. A, doi:10.1016/j.nima.2010.11.077

**C. Steier**, et al., *Successful Completion of the ALS Top-off Upgrade*, AIP conference proceedings of SRI 2009, 10th International Conference on Radiation Instrumentation, Melbourne, Australia (2009)

L. Yang, D. Robin, F. Sannibale, **C. Steier**, Weishi Wan, *Global optimization of an accelerator lattice using multiobjective genetic algorithms*, Nucl. Instr. & Meth. A, 609, 1 (2009) 50-57, doi:10.1016/j.nima.2009.08.027

**C. Steier**, L. Yang, *Touschek Lifetime Measurements at Small Horizontal Emittance in the ALS*, proceedings of PAC 2009

J. Corlett, W. Fawley, S. Lidia, H. Padmore, G. Penn, I. Pogorelov, J. Qiang, F. Sannibale, J. Staples, **C. Steier**, M. Venturini, W. Wan, R. Wilcox, A. Zholents, *FEL Design Studies at LBNL: Activities and Plans*, ICFA Beam Dynamics Newsletter, 42, 51 (2007)

**C. Steier**, et al., *Successful Completion of the Femtosecond Slicing Upgrade at the ALS*, Proceedings of the 22nd Particle Accelerator Conference 2007, Albuquerque, June 2007

S. Marks, S. Prestemon, D. Robin, R.D. Schlueter, **C. Steier**, A. Wolski, J.Y. Jung, and O. Chubar, *Shift Dependent Skew Quadrupole in Advanced Light Source Elliptically Polarizing Undulators, Cause and Corrections*, IEEE Transactions on Applied Superconductivity 16, 1 (2006)

D. Robin, J. Krupnick, R. Schlueter, **C. Steier**, S. Marks, B. Wang, J. Zbasnik, et al., *Superbend upgrade of the Advanced Light Source* Nucl. Instrum. Meth. A 538, 1-3 (11 February 2005), 65-92

T. Scarvie, N. Andresen, K. Baptiste, J. Byrd, M. Martin, W.R. McKinney, and **C. Steier**, *Noise reduction efforts for the ALS infrared beamlines* Infrared Physics and Technology 45(5-6), 403-408 (2004)

**C. Steier**, et al., *Operational Experience Integrating Slow and Fast Orbit Feedbacks at the ALS*, Proceedings of the 2004 European Particle Accelerator Conference, Lucerne, Switzerland, July 2004

**C. Steier**, et al., *Coupling Correction and Beam Dynamics at Ultralow Vertical Emittance in the ALS*, Proceedings of the Particle Accelerator Conference 2003, Portland, Oregon, May 2003

**C. Steier**, D. Robin, L. Nadolski, W. Decking, Y. Wu, and J. Laskar, *Measuring and Optimizing the Momentum Aperture in a Particle Accelerator*, Phys. Rev. E 65, 056506 (2002)

J. Safranek, G. Portmann, A. Terebilo, **C. Steier**, *MATLAB-based LOCO*, Proceedings of the European Particle Accelerator Conference 2002, Paris, France, June 2002

J. Byrd, W. P. Leemans, A. Loftsdottir, B. Marcelis, Michael C. Martin, W. R. McKinney, F. Sannibale, T. Scarvie, and **C. Steier**, *Observation of broadband self-amplified spontaneous coherent terahertz synchrotron radiation in a storage ring*, Phys. Rev. Lett. 89, 22, 224801 (2002)

A. Young, J. Feng, E. Arenholz, H.A. Padmore, T. Henderson, S. Marks, E. Hoyer, R. Schlueter, J.B. Kortright, V. Martynov, **C. Steier**, G. Portmann, *First commissioning results for the elliptically polarizing undulator beamline at the Advanced Light Source*, Nucl. Instr. & Meth. A, 467 (July 2001), p. 549

**C. Steier**, J. Byrd, P. Kuske, *Energy Calibration of the Electron Beam of the ALS using Resonant Depolarization*, Proceedings of the European Particle Accelerator Conference 2000 in Vienna, Austria

D. Robin, **C. Steier**, J. Laskar, L. Nadolski, *Global dynamics of the Advanced Light Source revealed through experimental frequency map analysis*, Phys. Rev. Lett., 85, 3, 558 (2000)

M. Gentner, R. Brinkmann, Y. Derbenev, D. Husmann, **C. Steier**, *On the Possibilities of Electron Cooling for HERA*, Nucl. Instr. and Meth. A 424 (1999) 277

S. Nakamura, W.v. Drachenfels, D. Durek, F. Frommberger, M. Hoffmann, D. Husmann, B. Kiel, F. Klein, F.J. Klein, D. Menze, T. Michel, T. Nakanishi, J. Naumann, S. Okumi, T. Reichelt, H. Sato, B. Schoch, **C. Steier**, K. Togawa, T. Toyama, S. Voigt, M. Westermann, *Acceleration of polarized electrons in ELSA*, Nucl. Instr. and Meth. A 411 (1998) 93

---

## Selected Presentations

- 2015 *Work towards a soft x-ray diffraction limited upgrade of the ALS (ALS-U)*, Low Emittance Rings Workshop (LER) 2015 (invited talk)
- 2015 *Reaching the Soft X-ray Diffraction Limit: ALS-U, A Revolutionary Upgrade of the ALS*, LBNL Instrumentation Colloquium
- 2014 *Overview of Lattice Options for Diffraction-Limited Storage Rings*, Diffraction Limited Storage Ring Workshop (DLSR) 2014 (invited talk)
- 2013 *ALS-II Plans*, Diffraction Limited Storage Ring Workshop (DLSR) 2013 (invited talk)
- 2013 *Successful Completion of the ALS Brightness Upgrade*, North American-Particle Accelerator Conference 2014 (contributed talk)
- 2013 *Successful Completion of the ALS Brightness Upgrade*, Synchrotron Radiation Instrumentation (SRI) 2013 (invited talk)
- 2012 *Possible USR Upgrade of the ALS (pre-conceptual)*, Ultimate Storage Ring Workshop (USR) 2012 (invited talk)
- 2012 *Feedbacks for Ultimate Storage Rings*, Ultimate Storage Ring Workshop (USR) 2012 (invited talk)
- 2012 *Ultimate Storage Ring Based Light Sources, Comparison and Potential Synergies with ERLs*, Future Light Source Workshop (FLS) 2012 (invited talk)
- 2011 *ALS Upgrades: Past and Present*, SSRF seminar (seminar)
- 2011 *Status of the ALS Upgrade*, Particle Accelerator Conference 2011 (contributed talk)
- 2011 *Non-linear dynamics optimization in low emittance rings: from model to experiments*, Low Emittance Rings Workshop (LER) 2011 (invited talk)
- 2010 *Summary of Workshop on Low Emittance Rings 2010*, Future Light Source Workshop (FLS) 2010 (invited talk)
- 2010 *Lattice and Emittance Optimization Techniques and the ALS Brightness Upgrade*, Synchrotron Radiation Instrumentation (SRI) 2010 (invited talk)
- 2010 *Optimization Algorithms and the ALS Lattice Upgrade*, Low Emittance Rings Workshop (LER) 2010 (invited talk)
- 2009 *State of Beam Stability and Control in Synchrotron Light Sources*, Particle Accelerator Conference 2009 (invited talk)
- 2009 *Beam stability challenges in ERLs*, Energy Recovery Linacs Workshop (ERL) 2009 (invited talk)

- 2008 *Beam dynamics effects of Elliptically Polarizing Undulators (APPLE-II type EPU's)*, NSLS-2 seminar (seminar)
- 2006 *What are good stabilization strategies and their limits in ERLs*, Future Light Source Workshop (FLS) 2006 (invited talk)
- 2005 *Few Bunch Operation at the ALS : Accelerator Physics Issues*, 2005 CLS user meeting (invited talk)
- 2005 *The ALS: Recent Improvements and future Plans*, BESSY seminar (seminar)
- 2005 *Measuring and Understanding the Momentum Aperture in a Storage Ring*, 2005 Particle Accelerator Conference (invited talk)
- 2004 *ALS orbit feedbacks*, European Particle Accelerator Conference 2004 (contributed talk)
- 2004 *Recent Progress at the ALS: Fast Orbit Feedback and Preparation for Top-off*, International Workshop on Beam Orbit Stabilization (IWBS) 2004 (invited talk)
- 2003 *Accelerator Physics Challenges of the fs-Slicing Upgrade at the ALS*, Particle Accelerator Conference 2003 (contributed talk)
- 2002 *Slow Orbit Feedbacks at the ALS*, International Workshop on Beam Orbit Stabilization (IWBS) 2002 (invited talk)
- 1999 *Frequency Map Measurements in the ALS*, Paris Nonlinear Dynamics Workshop (invited talk)
- 1996 *Performance and Future Developments at ELSA*, Workshop on Electromagnetic Interactions, Bosen (invited talk)

---

## References

Available upon request