

# CURRICULUM VITAE FOR FRANK ANDREAS BÄUERLE

## BUSINESS ADDRESS

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## EDUCATION

University of California at San Diego, La Jolla, California, United States of America

Ph.D. in Mathematics, June 1994

Dissertation: Complexity Theoretic Algebra

Areas of concentration: Complexity Theory, Complexity Theoretic Algebra,  
Linear Logic, P-Time Models, Recursion Theory, Recursive Algebra.

MA in Mathematics, June 1991

Technische Hochschule Friedericiana (Karlsruhe Institute of Technology), Karlsruhe,  
Federal Republic of Germany

Vordiplom in Mathematics (Minor in Computer Science), Sept. 1987

## WORK EXPERIENCE

Senior Lecturer with Security of Employment (Teaching Professor),

July 2015-Present, UC Santa Cruz, Santa Cruz, California, United States of America.

Lecturer,

July 1994 - June 2015, UC Santa Cruz, Santa Cruz, California, United States of America.

- Develop and teach UC-wide on-line Calculus courses with Distinguished Professor Anthony Tromba (Online versions of Math 19A, Math 19B, Math 23A and Math 23B have been created and have been taught successfully multiple times). These courses were created in collaboration with UC Online (UCOE/UCOP) and W.H. Freeman and Co. Math 19A, Math 19B, Math 23A and Math 23B are four of the UC-wide crossenrollment on-line courses and are articulated across the UC system. In particular Math 19A and Math 19B are the first courses to be articulated at all nine undergraduate serving UC's in the history of UC.
- Lead faculty teams of up to four faculty to facilitate the use of the online courses for other faculty or GSI. Train other faculty in the use of the resources and the management of the format. (2015-present)
- Serve as Undergraduate Vice Chair for the Mathematics Department. (2015-2022)  
The vice chair is involved with all curricular matters involving lower-division and

upper-division Mathematics courses and policies. This includes articulation agreements, adjudicating appeals, advising faculty, meeting routinely with students as well as faculty and staff (including from other departments and divisions) on curricular matters, collaborating closely with the staff undergraduate advisor and departmental leadership as well as working with divisional and campus leadership.

- Serve as acting chair (various times, 2015-present).
- Serve as co-director during the academic year of 2004-2005 for the California State Summer School in Mathematics and Science ("COSMOS") at UC Santa Cruz.
- Teach a mathematics module titled "Logic, Riddles and Paradoxes" for COSMOS (2000-2014). Teach a module on Cryptography during Summer of 2013.
- Organize and coordinate departmental teaching assistant (TA) training effort (1994-2018). In particular, conduct quarterly TA-training seminars for the Mathematics Department at UC Santa Cruz. Assist in the hiring of TA's from other departments.
- Teach a large variety of undergraduate mathematics courses, ranging from lower-division introductory Algebra and Precalculus to upper-division Logic and Set Theory courses.
- Assist in the TA assignment process as well as the selection of suitable GSI for Mathematics courses, during the academic year as well as for summer session.
- Designated faculty supervisor for Mathematics GSI in summer (Until Summer Session 2017).
- Supervise graduate student GSI's during the academic year who teach online calculus or other lower-division courses. (2000-2017)
- Present personnel cases for faculty merit and/or promotion review action at the department level. (2017-present)
- Participate in UCSC's Leadership Academy. (Winter 2016)
- Organize the weekly undergraduate colloquium in the Mathematics Department at UCSC. ( $\approx$ 2000 - 2013)
- On behalf of the division, assess the options to improve the delivery and impact of the mathematics diagnostic and placement test at UC Santa Cruz for continuing as well as incoming students (2004).
- Collaborate with colleague Nandini Bhattacharya on developing and implementing a comprehensive learning-style specific approach to help students overcome difficulties in mathematics preparation. This work was in part funded by a major instructional improvement grant from the Committee on Teaching at UC Santa Cruz. (2006-2009)
- Supervise and instruct undergraduate mathematics majors in a supervised teaching course (Math 188) designed to give them their first hands-on experience teaching mathematics. (1994-2020)
- Advise and mentor junior faculty such as new lecturers or senate faculty, visiting assisting professors, postdocs. ( $\approx$ 2000-present)

- Occasionally supervise and instruct graduate or undergraduate students in individual reading and research courses in mathematical logic and set theory or other topics.
- Occasionally supervise senior theses.
- Webmaster for the COSMOS web site in its first year (2000).

Consultant, 2004-2014, Educational Testing Services,  
Princeton, New Jersey, United States of America

- Serve as member and later as Chair on the CLEP College Mathematics committee. Design and analyze questions for CLEP exams.

Consultant, Summer 2000, Academic Systems Corporation,  
Mountain View, California, United States of America

- Program components of the randomized version for Academic System's multimedia software package in Algebra.

Consultant, Ongoing, Various Publishers,  
United States of America

- Review textbooks, software and educational materials.

Founder & VP Research and Development, January 1997 - June 1998, Knowledge Systems Group (KSG), L.L.C., a start-up, Las Vegas, Nevada, United States of America

- Design and implement the database driven components of EducationCommunity.com, the public service higher education policy web site by KSG.
- Design CuttingTools® Research utility, a product by KSG.
- Consult with other KSG members on web site design and implementation of EducationCommunity.com.

Consultant, May 1995 - July 1995, StraDigi, Inc.,  
Topanga, California, United States of America

- Consult on the design of a data storage and retrieval system for StraDigi On-Line.

Visiting Researcher, September 1993 - December 1993, Department of Computer Science, Monash University, Melbourne, Australia

- Research with Professor J.N. Crossley on applications of linear logic to computer science.

Visiting Research Assistant, Spring 1991, Mathematical Sciences Institute, Cornell University, Ithaca, New York, United States of America

- Research under the supervision of Professor J.B. Remmel on the interaction of polynomial time complexity theory and recursive algebra.

Data base programmer/manager, October 87 - September 88, Evangelisches Studienwerk Villigst, Schwerte, Federal Republic of Germany

- Design and manage database system for the Evangelisches Studienwerk Villigst.
- Program query applications.
- Organize and oversee the transfer of data from the external data management firm to the internal database system.
- Maintain the LAN (1 server, 8 PC's)

- Assist secretaries in using hardware and learning software applications.

Erziehungshelfer, October 82 - September 85, Evangelische Stiftung Lichtenstern, Löwenstein, Federal Republic of Germany

- As a member in a team of four educators assist in the comprehensive care of ten severely mentally and physically handicapped men of all ages at an institution for mentally handicapped people in Löwenstein, Germany.
- Discuss, plan and implement strategies for the improvement of care of the patients on a personal and institutional level.

## PUBLICATIONS

- 1) In collaboration with Prof. Anthony Tromba, an interactive E-Book based on Rogawski, Calculus, 2nd. ed., Early Transcendentals and Marsden/Tromba, 6th ed., Vector Calculus. This is the textbook for UC Online Calculus I,II,III and IV / Math 19A,19B, 23A and 23B Online.
- 2) F.A. Bäuerle, *Complexity Theoretic Algebra*, Ph.D. Thesis, University of California, San Diego, 190 pages, 1994
- 3) F.A. Bäuerle, J.B. Remmel, *On speedable and levelable vector spaces*, Annals of Pure and Applied Logic 67, 61-112, 1994.
- 4) D.W. Albrecht, F.A. Bäuerle, J.N. Crossley, J. Jeavons, *Curry-Howard terms for Linear Logic*, Studia Logica 61, 223-235, 1998.
- 5) F.A. Bäuerle, *Nowhere simplicity in NP sets and vector spaces*, in preparation.
- 6) F.A. Bäuerle, *Breidbardt splitting for vector spaces doesn't necessarily split*, in preparation.
- 7) F.A. Bäuerle, *A supermaximal vector space in P*, in preparation.
- 8) F.A. Bäuerle, *Difference Triangles in polynomial time*, in preparation.

## PRESENTATIONS AND WORKSHOPS

University of California, Santa Cruz, 1994-Present

- Together with Bernie Luskin and Ashley Skylar participated in a panel discussion for the DET/CHE Leadership Program: Instructional Development Panel (June 2022, invited)
- Together with Tony Tromba, Juliette Levy (UCR) and Dan Garcia (UCB) participated in a panel discussion at the UC Online conference, Digital Transformation of UC: The Next Chapter. (October 2021, invited)
- Together with Henry Burnett, Katrina Fullman and Anthony Tromba presented at the DET/CHE conference (<http://conference.detche.com/>) in San Diego, "Online Calculus Courses: Success for 15,000 UC Students". (December 2019, invited)
- Together with Anthony Tromba presented our UC online Calculus courses at various times and locations:
  - UCSD Center for Advancing Mathematics, Science, and Engineering Education (CAMSEE) (Winter 2015, invited)
  - Defense Language Institute, Department of Mathematics, Monterey, CA (Spring 2015, invited)

- UCI Department of Mathematics (Fall 2014, invited)
- UCSC-wide advising conference (Winter 2014, invited)
- UCSC Chancellor Blumenthal (Summer 14, invited)
- UCSC Senate Committee on Academic Freedom (Spring 2014, invited)
- UCSC Senate Committee on Educational Policy (Fall 2013, invited)
- UC system-wide ILTI conference at UCOP (Spring 2013, invited)
- Together with Robert Boltje participated at the STEM transfer Day at UCSC (Spring 2014)
- Run a workshop at UCSC's Algebra Academy with about 30 prospective students (Winter 2015)
- Run a workshop at Scotts Valley Middle School with about 30 middle school students (Winter 2015)
- Many Undergraduate Colloquium Talks on a variety of topics
- Presented UC online Calculus I at UCSC Senate Educational Technology Trade Show (January 2013)
- Panel speaker on preparedness of incoming students at the UC Advising Conference.
- Panel Speaker at “The 2008 Teaching & Learning Symposium” at UC Santa Cruz on “Effectively Integrating TA’s and Other Resources to Support Student Learning”
- Organize and run a session on teaching quantitative materials at the annual campus-wide TA-training conference.
- Assorted talks, for instance at Johns Hopkins Odyssey conference at UCSC, Monterey Bay Area Mathematics Project (MBAMP) annual meeting, Santa Cruz library, etc.
- Run MBAMP Math Teacher Circles (Various times)
- Run workshops for Learning Support Services, STARS, MBAMP, etc. (various times)

## **ACADEMIC SERVICE**

### University of California, Santa Cruz, 1994-Present

- Serve as Undergraduate Vice Chair for the Mathematics Department. (2015-2022)
- Chair the departmental committee on "Precalculus and Calculus" (2016-2018)
- Chair the departmental textbook committee (2016-present)
- Member of the departmental development committee (2017-present)
- Serve on campus-wide review committee to evaluate on-line course proposals.
- Serve on hiring committees including for the Faculty Director for the Center in Teaching and Learning (CITL) at UCSC as well as for several department staff and faculty positions.
- Serve as reviewer for ILTI as part of the RFP for the development of UC-wide online courses. (2014-present, RFP 3,4,5,6,7)
- Serve on the UCSC Summer Initiative. (2022)

- Serve as departmental lead representative for negotiations with Applied Mathematics on sharing the teaching of Calculus. This led to an MOU for three years. (2021-2022)
- Serve as departmental lead faculty for stakeholder meetings re the curricular redesign efforts for the re/design of mathematics courses for students in the physical and biological sciences (2021-present).
- Serve as faculty representative to the divisional committee to conduct a comprehensive review of the advising and undergraduate affairs model in the PbSci division (2015).
- Participate at Outreach Events such as Algebra Academy, Spring Spotlight.
- Participate at summer new student and new transfer student orientations.
- Serve on the divisional awards committee (2016-2017, 2020-2021)
- Help select Young's undergraduate award recipient in Mathematics (2016-2022)
- Help select a graduate student in Mathematics for the Outstanding TA award.
- Serve on the campus-wide workgroup on implementation of APM changes to the LSOE faculty series (2019).
- Serve on a departmental committee on the Placement exam. (Fall 2014)
- Serve on the systemwide BOARS committee as content expert. (2014-2015)
- Serve on the Faculty Oversight Committee of COSMOS. (2012-2015)
- Serve on the Academic Senate Committee on Preparatory Education. (2010-2012)
- Serve on the Academic Senate Committee on Information Technology (CIT). (2017-2019)
- Serve on the Academic Senate Committee on Teaching (COT). (2004-2006, 2020-2021)
- Serve on the Academic Senate Committee on Academic Personnel (CAP). (2021-2022)
- Serve on the Canvas Steering Committee. (2017-2019, 2020-2021)
- Serve as the departmental representative to the HSI Mathematics team. (2016-present)
- Serve as faculty representative to the UCSC Classroom Subcommittee as part of the Kresge College remodel project (2018).
- Serve on the NSTF Committee on Committees (COC). (2006-2007)
- Serve on the COSMOS Advisory Board as faculty representative. (2002-2003).
- Serve on the Academic Resources Committee at UC Santa Cruz. (2003-2004).
- Evaluate the potential for teaching excellence of recruitment candidates in the Mathematics Department. (2002-2004)
- Attend UCSC events as faculty representative such as EOP faculty dinner, graduation, etc. (1999-present)
- Write letters of recommendation and provide reference for a large number of undergraduate students pursuing internships, jobs or professional school. (1995-present)
- Write letters of recommendation and provide reference for a large number of graduate students pursuing jobs or professional opportunities. (1995-present)
- Write external review letters on merit and promotion cases, including merit to step 6, for Teaching Professors at several other UC's. (2017-present)

- Assist graduate students in the job application process (1995-present).

#### University of California, San Diego, 1989-90

- Graduate Student representative of the mathematics department to the Graduate Student Association (GSA)
- Graduate Student representative of the GSA to the Associated Students.

#### Evangelisches Studienwerk Villigst, 1986-1987

- Served as student representative on several committees to select finalists and fellowship recipients for the Evangelisches Studienwerk Villigst.

#### Technische Hochschule Friedericihana Karlsruhe, 1985-1987

- Elected President of Fachschaft Mathematik (Student Union).
- Served as student representative on the Fakultätsrat (Board of the Faculty of the Mathematics Department at Friedericihana).

## **AWARDS**

Excellence in Teaching Award, University of California, Santa Cruz, June 2014

Universal Design of Instruction Award, , Disability Resource Center, University of California, Santa Cruz, June 2010

Excellence in Teaching Award, University of California, Santa Cruz, June 2000

## **FELLOWSHIPS AND GRANTS**

Seeding Strategies Grant, California Education Learning Lab, 2022-2024, \$100,000, Lead Co-PI.

This grant was awarded as part of the Learning Lab’s RFP “Seeding Strategies (I) to Close the Calculus Equity Gap”. For details see here:

<https://calearninglab.org/project/improving-calculus-learning-outcomes-for-student-success-in-engineering/>

Cohort Facilitator Grant, California Education Learning Lab, 2021-2024, \$500,000, Co-PI.

This grant was awarded as part of the Grand Challenge (<https://calearninglab.org/grant/the-grand-challenge/>): Overcoming the Calculus Barrier to STEM Success. For details see here:

<https://calearninglab.org/project/c3-convene-connect-collaborate/>

ILTI Course Development Grant, UC Online, Oakland, 2014-present, \$250,000, Co-PI

This grant was awarded to develop and implement the on-line versions of Math 23A and Math 23B to be used as system-wide on-line Vector Calculus courses.

Course Development Grant, UC Online, Oakland, 2013-2014, \$125,000, Co-PI

This grant was awarded to develop and implement the on-line version of Math 19B to be used as a system-wide on-line Calculus course.

Course Development Grant, UC Online, Oakland, 2012-2013, \$125,000, Co-PI

This grant was awarded to develop and implement the on-line version of Math 19A to be used as a system-wide on-line Calculus course.

Instructional Improvement Major Grant, UC Santa Cruz, 2006, \$15,000, Co-PI

This grant was awarded to develop and implement a pilot project as part of a comprehensive approach to address the issue of mathematics placement, preparation and review of incoming and continuing undergraduate students.

Instructional Improvement Mini Grant, UC Santa Cruz, 1999, \$500, PI

This grant was awarded to update the web sites for my courses from static to interactive web sites.

Instructional Improvement Grant, UC Santa Cruz, 1996, \$1000, PI

This grant was awarded to produce a TA-manual for the Mathematics Department at UC Santa Cruz, Spring 1996.

Auslandsstipendium (Fellowship for study abroad), Evangelisches Studienwerk Villigst, October 87 - September 88

Stipendium, (Fellowship), Evangelisches Studienwerk Villigst, March 86 - September 87