

Curriculum Vitae

Carlo Albert

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Education

Doctor of Physics, Dr. Phys. ETH

Accepted under the recommendation of Prof. Jürg Fröhlich (examiner) and Prof. Giovanni Felder (co-examiner) at the Institute for Theoretical Physics, ETH Zürich, Switzerland

Diploma in Mathematics, Dipl. Math. ETH with honors

Awarded with the [Polya prize](#), diploma thesis under the supervision of Prof. Norbert Straumann at the Institute for Theoretical Physics, University of Zürich, Switzerland

Professional Experience

Group leader (since 2012)

Department of Systems Analysis, Integrated Assessment and Modeling (SIAM), Eawag, Dübendorf, Switzerland

Post-Doc (2009-2012)

SIAM, Eawag, Dübendorf, Switzerland

Post-Doc (2007-2009)

Section de Mathématiques, Université de Genève, Switzerland

Projects and Grants

Calibrating stochastic hydrological models to signatures (2017-2020)

PI: Carlo Albert, SNF grant, 174 kCHF

Critical dynamics in phytoplankton communities? (2015-2018)

PI: Carlo Albert, Interdisciplinary SNF grant, 170 kCHF

Parameter inference with stochastic differential equation models (2014-2016)

PI: Carlo Albert, Eawag Discretionary Fund

Using Commercial Microwave Links and Computer Model Emulation to Reduce Uncertainties in Urban Drainage Simulations (COMCORDE) (2011-2016)

PI: Jörg Rieckermann, Interdisciplinary SNF grant, 639 kCHF

Languages

German: native speaker

French: fluent in writing and speaking

English: fluent in writing and speaking

Publications

Papers in preparation or submitted

Carbajal, J.P., Leitão, J.P., Albert, C., Rieckermann, J., *Appraisal of data-driven and mechanistic emulators of nonlinear hydrodynamic urban drainage simulator*, submitted.

Ulzega, S., Albert, C. *Fast Bayesian parameter inference in hydrological modelling using a Hamiltonian Monte Carlo approach with a stochastic rain model*, in preparation.

Machac D., Reichert P., Rieckermann J., Del Giudice D., Albert C. *Accelerating Bayesian inference in hydrological modelling with a mechanistic emulator*, submitted.

Fenicia F., Reichert P., Kavetski D., Albert C. *Uncertainty quantification in signature based hydrological model calibration using Approximate Bayes Computation*, in preparation.

Peer-reviewed articles 2010 - 2016

Stoop, R., Kanders, K., Lorimer, T., Held, J., Albert, C. *Big data naturally rescaled*, *Chaos and Fractals* **90** (2016).

Ashauer, R., et al. *Modeling survival: exposure pattern, species sensitivity and uncertainty*, *Sci. Rep.* **6** (2016).

Albert, C., Vogel, S., Ashauer, R. *Computationally efficient implementation of a novel algorithm for the general unified threshold model of survival (GUTS)*, *PLOS Comp. Biol.* **12** (2016).

Albert, C., Ulzega, S., Stoop, R. *Boosting Bayesian parameter inference of nonlinear stochastic differential equation models by Hamiltonian scale separation*. *Phys. Rev. E* **93** (2016).

Machac, D., Reichert, P., Albert, C. *Emulation of dynamic simulators with application to hydrology*, *J. Comp. Phys.* **313** (2016).

Del Giudice, D., Albert, C., Rieckermann, J., Reichert, P. *Describing the catchment-averaged precipitation as a stochastic process improves parameter and input estimation*. *WRR* **52** (2016).

Machac, D., Reichert, P., Rieckermann, J., Albert, C. *Fast mechanism-based emulator of a slow urban hydrodynamic drainage simulator*. *Env. Mod. & Soft.*, **78**, 54-67, (2016).

Del Giudice, D., Reichert, P., Bareš, V., Albert, C., & Rieckermann, J. *Model bias and complexity—Understanding the effects of structural deficits and input errors on runoff predictions*. *Env. Mod. & Soft.*, **64**, 205-214, (2015).

Albert C., Künsch HR., Scheidegger A., *A Simulated Annealing Approach to Approximate Bayes Computations*, *Stat. Comput.* **6**, 1217-1232 (2014): [arXiv:1208.2157](https://arxiv.org/abs/1208.2157) [stat.CO].

Abreu J.A et al. *Response to: "Critical Analysis of a Hypothesis of the Planetary Tidal Influence on Solar Activity" by S. Poluianov and I. Usoski* *Solar Physics* **6**, 2343-2344 (2014).

Glüge, S., Pomati, F., Albert, C., Kauf, P., Ott, T. *The challenge of clustering flow cytometry data from phytoplankton in lakes*. In Mladenov, V. and Ivanov, P., editors, *Comm. Comp. Inf. Sci.* **438** 379-386, (2014).

Rinderknecht, S.L., Albert, C., Borsuk, M., Schuwirth, N., Künsch, H.R., Reichert, P.: *The Effect of Ambiguous Prior Knowledge on Bayesian Model Parameter Inference and Prediction*, *Env. Mod. Soft* **62**, 300-315. (2014).

Del Giudice, D., Honti, M., Scheidegger, A., Albert, C., Reichert, P., Rieckermann, J., *Improving uncertainty estimation in urban hydrological modeling by statistically describing bias*, [Hydrol. Earth Syst. Sci.](#) **17**, 4209-4225 (2013).

Albert C., *A Mechanistic Dynamic Emulator*, *J. Nonlinear Analysis B* **13**, 2747–2754 (2012): [arXiv:1112.5304v2](#) [stat.ME].

Albert C., Ashauer R., Künsch HR., Reichert P., *Bayesian Experimental Design for a Toxicokinetic-Toxicodynamic Model*, *J. Stat. Planning and Inference* **142**, 263-275 (2012).

Jager T., Albert C., Preuss T.G., Ashauer R., *General Unified Threshold Model of Survival - a Toxicokinetic Toxicodynamic Framework for Ecotoxicology*, *Env. Sci. Tech.*, **45**, 2529-2540 (2011).

Ashauer R. et al., *Toxicokinetic-Toxicodynamic modeling of quantal and graded sublethal endpoints: a brief discussion of concept*, *Env. Tox. Chem.* **30**, 2519-24 (2011)

Calogovic J., Albert C., Arnold F., Beer J., Desorgher L., and Flueckiger E. O., *Sudden cosmic ray decreases: No change of global cloud cover*, *Geophys. Res. Lett.* **37**, doi:10.1029/2009GL041327, (2010).

Albert C., Bleile B. and Fröhlich J., *Batalin-Vilkovisky integrals in finite dimensions*, *J. Math. Phys.* **51**, Fiftieth Anniversary Special Issue (2010).

Non-peer reviewed articles:

Albert C., *A Simulated Annealing Approach to Bayesian Inference*, [arXiv:1509.05315](#) [stat.CO], (2015).