Output list

Patrick Zulian

September 26, 2025

Publications in international peer-reviewed scientific journals

[1] S. Ben Bader, P. Benedusi, A. Quaglino, P. **Zulian**, and R. Krause, *Space-time multilevel monte carlo methods and their application to cardiac electrophysiology*, Journal of Computational Physics, 433 (**2021**), p. 110164.

[2] P. Benedusi, S. Riva, P. **Zulian**, J. Štěpán, L. Belluzzi, and R. Krause, *Scalable matrix-free solver for 3d transfer of polarized radiation in stellar atmospheres*, Journal of Computational Physics, (**2023**), p. 112013.

[3] I. Berre, W. M. Boon, B. Flemisch, A. Fumagalli, D. Gläser, E. Keilegavlen, A. Scotti, I. Stefansson, A. Tatomir, K. Brenner, S. Burbulla, P. Devloo, O. Duran, M. Favino, J. Hennicker, I.-H. Lee, K. Lipnikov, R. Masson, K. Mosthaf, M. G. C. Nestola, C.-F. Ni, K. Nikitin, P. Schädle, D. Svyatskiy, R. Yanbarisov, and P. **Zulian**, *Verification benchmarks for single-phase flow in three-dimensional fractured porous media*, Advances in Water Resources, 147 (**2021**), p. 103759.

[4] R. Cavoretto, T. Schneider, and P. **Zulian**, *OpenCL based parallel algorithm for RBF-PUM interpolation*, Journal of Scientific Computing, 74 (**2018**), pp. 267–289.

[5] R. Krause and P. **Zulian**, *A parallel approach to the variational transfer of discrete fields between arbitrarily distributed unstructured finite element meshes*, SIAM Journal on Scientific Computing, 38 (**2016**), pp. C307–C333.

[6] M. G. C. Nestola, B. Becsek, H. Zolfaghari, P. **Zulian**, D. De Marinis, R. Krause, and D. Obrist, *An immersed boundary method for fluid-structure interaction based on variational transfer*, Journal of Computational Physics, 398 (**2019**), p. 108884.

[7] M. G. C. Nestola, P. **Zulian**, M. Favino, and R. Krause, *Conservation properties of non-conforming embedded finite-element methods based on Lagrange multipliers*, BIT Numerical Mathematics, 65 (**2025**), p. 34.

[8] M. G. C. Nestola, P. **Zulian**, L. Gaedke-Merzhäuser, and R. Krause, *Fully coupled dynamic simulations of bioprosthetic aortic valves based on an embedded strategy for fluid–structure interaction with contact*, EP Europace, 23 (**2021**), pp. i96–i104.

[9] S. Osborn, P. **Zulian**, T. Benson, U. Villa, R. Krause, and P. S. Vassilevski, *Scalable hierarchical PDE sampler for generating spatially correlated random fields using nonmatching meshes*, Numerical Linear Algebra with Applications, 25 (**2018**), p. e2146.

[10] E. Pezzulli, P. **Zulian**, A. Kopaničáková, R. Krause, and T. Driesner, *The limitations of a standard phase-field model in reproducing jointing in sedimentary rock layers*, International Journal for Numerical and Analytical Methods in Geomechanics, n/a (**2025**).

[11] P. Schädle, P. **Zulian**, D. Vogler, B. R. Sthavishtha, M. G. C. Nestola, A. Ebigbo, R. Krause, and M. O. Saar, *3D non-conforming mesh model for flow in fractured porous media using Lagrange multipliers*, Computers & Geosciences, 132 (**2019**), pp. 42–55.

[12] P. **Zulian**, S. Ben Bader, G. Fourestey, R. Krause, and D. Rossinelli, *Data-centric workloads with MPI_Sort*, Journal of Parallel and Distributed Computing, 187 (**2024**), p. 104833.

[13] P. **Zulian**, A. Kopaničáková, M. G. C. Nestola, N. Fadel, A. Fink, J. VandeVondele, and R. Krause, *Large scale simulation of pressure induced phase-field fracture propagation using Utopia*, CCF Transactions on High Performance Computing, (**2021**).

[14] P. **Zulian**, T. Schneider, K. Hormann, and R. Krause, *Parametric finite elements with bijective mappings*, BIT Numerical Mathematics, 57 (**2017**), pp. 1185–1203.

[15] P. **Zulian**, P. Schädle, L. Karagyaur, and M. G. Nestola, *Comparison and application of non-conforming mesh models for flow in fractured porous media using dual lagrange multipliers*, Journal of Computational Physics, (**2021**), p. 110773.

[16] C. von Planta, D. Vogler, P. **Zulian**, M. O. Saar, and R. Krause, *Contact between rough rock surfaces using a dual mortar method*, International Journal of Rock Mechanics and Mining Sciences, 133 (**2020**), p. 104414.

Peer-reviewed conference proceedings

[17] N. Hassanjanikhoshkroud, M. Nestola, P. **Zulian**, C. Planta, D. Vogler, and R. Krause, *Thermo-fluid-structure interaction based on the fictitious domain method: Application to dry rock simulations*, in 45rd Workshop on Geothermal Reservoir Engineering Stanford University, Stanford - USA, **2020**, pp. 1–12.

[18] M. G. C. Nestola, B. Becsek, H. Zolfaghari, P. **Zulian**, O. Dominik, and K. Rolf, *An immersed boundary method based on the L^2–projection approach*, in Proceedings of the 24rd International Conference on Domain Decomposition Methods in Longyearbyen, Svalbard, Springer-Verlag, **2018**, pp. 1–8.

[19] M. G. C. Nestola, P. **Zulian**, D. Rossinelli, and R. Krause, *An immersed domain method for fluid-structure interaction with contact*, in DD28 proceedings, **2025**.

[20] C. Planta, D. Vogler, M. G. C. Nestola, P. **Zulian**, and R. Krause, *Variational parallel information transfer between unstructured grids in geophysics-applications and solutions methods*, in PROCEEDINGS, 43rd Workshop on Geothermal Reservoir Engineering Stanford University, Stanford - USA, **2018**.

[21] C. von Planta, D. Vogler, C. Xiaoqing, M. G. C. Nestola, P. **Zulian**, M. O. Saar, and R. Krause, *Simulating hydro-mechanical processes in rough fractures with a fluid-structure interaction (FSI) approach with a parallel transfer operator*, in AGU Fall Meeting 2018, Washington, DC, USA, **2018**.

Preprints

[22] D. Rossinelli, G. Fourestey, P. **Zulian**, T. Hildebrand, F. Krause, Rolf amd Verrey, J. Berberat, and V. Kurtcuoglu, *Fast and accurate thickness transformation of large 3d images*, To be submitted, (–).

[23] D. Rossinelli, G. Fourestey, P. **Zulian**, R. Krause, V. Kurtcuoglu, and J. Berberat, *Large-scale morphological operations*, To be submitted, (–).

Hackathons

[24] V. Kulka, A. Mokhtari, P. **Zulian**, and M. G. C. Nestola, *Cadrioimpact*, in Eurohack22: GPU programming hackathon, **2022**.

[25] R. Speck and P. **Zulian**, *Monodomain equation solver with pySDC*, in Time-X application hackathon, **2023**.

[26] P. **Zulian**, A. Kopaničáková, and M. G. C. Nestola, *Utopia: an EDSL for scientific computing*, in Eurohack18: GPU programming hackathon, **2018**.

[27] ——, *Utopia: a C++ library for parallel non-linear constrained multilevel solution methods*, in Eurohack19: GPU programming hackathon, **2019**.

Contributions to international conferences (presentations)

[28] S. Ben Bader, P. Benedusi, A. Quaglino, P. **Zulian**, M. Multerer, and R. Krause, *Space-time uncertainty quantification for cardiac electrophysiology*, in 14th WCCM/ECCOMAS Congress, **2020**.

[29] P. Benedusi, P. **Zulian**, C. Garoni, and R. Krause, *Time parallel and space–time approaches in electrophysiology*, in 6th Parallel in time Workshop, Ascona, Switzerland, October **2017**. Keynote.

[30] P. Benedusi, P. **Zulian**, and R. Krause, *A space–time multigrid method for electrophysiology*, in 25th International Domain Decomposition Conference (DD25), St. John's, Canada, July **2018**.

[31] ——, *Multigrid based strategies for the solution of non–linear space–time problems*, in SIAM Conference on Computational Science and Engineering (CSE19), Spokane, USA, February **2019**.

[32] ——, *A space-time semi-geometric multigrid method for electrophysiology*, in SIAM PP20, **2020**.

[33] P. Benedusi, P. **Zulian**, M. Minion, and R. Krause, *A comparison of space-time multigrid and PFASST with applications to cardiac electrophysiology*, in PinT 2020 - (Virtual) 9th Parallel in Time Workshop, **2020**.

[34] N. Fadel, P. **Zulian**, A. Kopaničáková, A. Fink, D. Ganellari, and R. Krause, *Utopia: a performance-portable C++ library for non-linear algebra*, in SIAM PP20, **2020**.

[35] ——, *Utopia: a performance-portable C++ library for non-linear algebra*, in Italian C++ Conference 2020, **2020**.

[36] D. Ganellari, N. Fadel, A. Fink, and P. **Zulian**, *Performance portable space filling curves algorithms for efficient mesh management in mars with kokkos*, in PASC 21, **2021**.

[37] H. Kothari, A. Kopaničáková, P. **Zulian**, and R. Krause, *Nonlinear domain decomposition and multilevel methods for solving phase-field fracture problems*, in 45eme Congrès National d'Analyse Numérique-CANUM 2020, Evian-les-Bains, France, June **2022**. oral.

[38] P. Kothari, Hardik and**Zulian** and R. Krause, *An algebraic domain decomposition strategy for solving the contact problems*, in International Conference on Computational Contact Mechanics 2023 Torino, Italy, **2023**.

[39] R. Krause, P. **Zulian**, E. Foster, and M. G. C. Nestola, *Parallel variation transfer between arbitrarily distributed non matching meshes and its application to contact mechanics and fluid structure interaction*, in ECCOMAS Congress 2016, Creete, jun **2016**.

[40] R. Krause, P. **Zulian**, P. Schaedle, M. G. C. Nestola, D. Vogler, S. Bhopalam, A. Ebigbo, and M. O. Saar, *Non-conforming domain decomposition methods for flow in fractured media - parallel realization and application*, in PASC 21, **2021**.

[41] M. G. C. Nestola, P. **Zulian**, and R. Krause, *A fictitious domain method for fluid-structure interaction based on the pseudo–L^2–projection between non conforming overlapping meshes*, in DD24 — The 24th. International Conference on Domain Decomposition Methods, Svalbard, jan **2017**.

[42] ——, *Fluid-structure interaction simulations of heart valves with dynamic contact*, in ENOC conference, Budapest, jun **2017**.

[43] ——, *An immersed approach to fluid structure interaction for biomedicine and geophysics*, in ECCM-ECFD 2018, Glasgow, jun **2018**.

[44] ——, *An embedded approach for fluid-structure-contact interaction problems and application to the aortic flow.*, in ICCCM 2-23 Conference, Torino, Italy 5-7 July 2023, **2023**.

[45] ——, *Embedded boundary approaches for fluid-structure interaction with application to the cardiovascular system.*, in 22nd Computational Fluid Conference in Cannes. 25-27 April. 2023, **2023**.

[46] M. G. C. Nestola, P. **Zulian**, D. Obrist, and R. Krause, *A fluid structure interaction approach based on the unfitted boundary method*, in WCCM 2018, New York, **2018**.

[47] C. Planta, M. Nestola, P. **Zulian**, R. Krause, N. Hassanjanikhoshkroud, H. Koestler, D. Vogler, X. Chen, and M. O. Saar, *Fictitious domain methods for simulating thermo-hydro-mechanical processes in fractures*, in EGU General Assembly 2020, Online, **2020**.

[48] P. **Zulian**, P. Benedusi, A. Quaglino, and R. Krause, *A space-time multigrid method for electrophysiology*, in SIAM PP18, **2018**.

[49] P. **Zulian**, N. Fadel, A. Kopaničáková, and R. Krause, *Utopia: a performance-portable C++ library for nonlinear algebra*, in SIAM CSE, **2021**.

[50] P. **Zulian**, A. Kopaničáková, M. G. C. Nestola, N. Fadel, A. Fink, D. Ganellari, J. VandeVondele, and R. Krause, *Utopia: A c++ library for parallel multilevel solution methods and for constrained non-linear problems*, in SIAM PP22, **2022**.

[51] ——, *Utopia: an open-source software for large scale simulations of pressure induced phase-field fracture propagation*, in APCOM-WCCM, **2022**.

[52] P. **Zulian**, A. Kopaničáková, M. G. C. Nestola, N. Fadel, A. Fink, J. VandeVondele, and R. Krause, *Utopia: a c++ library for parallel multilevel solution methods and for constrained non-linear problems - applications to geophysics*, in PASC 21, **2021**.

[53] P. **Zulian**, H. Kothari, G. Marchi, R. Krause, A. Nelson, and P. Vassilevski, *Shifted–penalty multigrid for contact*, in International Conference on Computational Contact Mechanics (ICCCM 2025), **2025**.

[54] P. **Zulian**, M. Nestola, L. Gaedke-Merzhäuser, and R. Krause, *An embedded formulation for fluid-structure interaction with contact*, in 14th WCCM/ECCOMAS Congress, **2020**.

[55] P. **Zulian**, M. Nestola, H. Kothari, L. Mangani, M. M. Alloush, E. Casartelli, and R. Krause, *Immersed domain approach for fluid-structure-contact interaction problems*, in U.S. National Congress on Computational Mechanics (USNCCM), **2023**.

[56] P. **Zulian**, M. Nestola, H. Kothari, A. Masero, M. M. Alloush, L. Mangani, F. Wermelinger, E. Casartelli, and R. Krause, *An embedded formulation for fluid-structure interaction with contact*, in 28th International Conference on Domain Decomposition Methods (DD28), **2024**.

[57] ——, *An immersed method for fluid-structure-contact interaction*, in International Research Conference on Multi-Grid and Multi-Scale Methods in Computational Science (IMG25), **2025**.

[58] ——, *immersed method for fluid-structure-contact interaction*, in FEM @ LLNL Seminar Series, **2025**.

[59] P. **Zulian**, M. Nestola, and R. Krause, *Immersed mesh methods for the solution of coupled finite element problems*, in International multigrid conference (IMG), **2023**.

[60] ——, *Immersed domain approach for fluid-structure-contact interaction problems*, in ECCOMAS – Coupled Problems, **2025**.

[61] ——, *Immersed domain approach for fluid-structure-contact interaction problems*, in SIAM – CSE, **2025**.

[62] P. **Zulian**, M. Nestola, L. Mangani, M. M. Alloush, E. Casartelli, and R. Krause, *An immersed domain method for fluid-structure interaction with contact*, in Computational Fluids Conference (CFC), **2023**.

[63] P. **Zulian**, M. Nestola, L. Mangani, M. M. Alloush, L. Karagyaur, E. Casartelli, and R. Krause, *An immerse domain method for fluid-structure interaction with contact*, in KAUST research conference. ExaFlow: Flow Simulation at the Exascale, **2022**.

[64] ——, *Immerse domain methods for fluid-structure interaction with contact*, in 11th European Solid Mechanics Conference (ESMC), **2022**.

[65] P. **Zulian**, M. Nestola, D. Rossinelli, and R. Krause, *Immersed techniques for fluid-structure interaction with applications to computational biomechanics*, in X International Conference of Computational Methods for Coupled Problems in Science and Engineering (COUPLED 2023), **2023**.

[66] P. **Zulian**, M. G. C. Nestola, M. Favino, C. von Planta, and R. Krause, *Multi-physics and multi-scale simulations for hydropower and geo-energy*, in SCCER SoE annual meeting, **2018**.

[67] P. **Zulian**, M. G. C. Nestola, and R. Krause, *A fictitious domain method for fluid-structure interaction*, in World Congress on Computational Mechanics, **2018**.

[68] P. **Zulian**, M. G. C. Nestola, P. Schaedle, D. Vogler, S. Bhopalam, A. Ebigbo, M. O. Saar, , and R. Krause, *3D non-conforming mesh model for flow in fractured porous media using Lagrange multipliers*, in X-DMS 2019, **2018**.

[69] P. **Zulian**, M. G. C. Nestola, C. von Planta, and R. Krause, *Contact, fluid structure interaction and variational transfer*, in Proceedings of the 7th GACM Colloquium on Computational Mechanics for Young Scientists from Academia and Industry October 11-13, 2017 in Stuttgart, Germany, Stuttgart, oct **2017**.

[70] P. **Zulian**, P. Schaedle, M. Nestola, H. Kothari, and R. Krause, *Variational methods for multi-physics: surface and volume coupling*, in U.S. National Congress on Computational Mechanics (USNCCM), **2023**.

[71] C. von Planta, A. Kopaničáková, M. G. C. Nestola, P. **Zulian**, D. Vogler, and R. Krause, *A parallel semi-geometric monotone multigrid method for contact in rough rock surfaces*, in 5th International Conference on Computational Contact Mechanics, Lecce - Italy, **2017**.

[72] ——, *Massively parallel and scalable solvers for simulating frictional contact on rough surfaces*, in Schatzalp Workshop on Induced Seismicity, Davos - Switzerland, **2017**.

[73] C. von Planta, A. Kopaničáková, P. **Zulian**, and R. Krause, *Multigrid methods for crack propagation and contact*, in 14th U.S. National Congress on Computational Mechanics, Montreal - Canada, **2017**.

[74] C. von Planta, M. G. C. Nestola, P. **Zulian**, D. Vogler, and R. Krause, *Parallel methods for contact problems in rough rock surfaces*, in SCCER-SoE Annual Conference 2017, Birmensdorf - Switzerland, **2017**.

Contributions to international conferences (keynotes)

[75] P. **Zulian**, M. Nestola, and R. Krause, *Immersed techniques for coupled problems: Simulating flow and transport in fractured porous media and fluid-structure-contact interaction*, in WCCM-PANACM, **2024**.

Contributions to national and international conferences (posters)

[76] P. Benedusi, P. **Zulian**, A. Auricchio, and R. Krause, *A fully parallel space–time multigrid solver for computational electrophysiology*, in Swiss Numerics Day, Zurich, Switzerland, April **2018**. Poster.

[77] D. Ganellari, P. **Zulian**, A. Fink, N. Fadel, B. Cumming, R. Krause, and J. VandeVondele, *Mars: Mesh adaptive refinement for supercomputing*, in PASC 21, **2021**.

[78] H. Kothari, A. Kopaničáková, P. **Zulian**, M. Nestola, E. Pezzulli, T. Driesner, and R. Krause, *Multilevel and domain-decomposition solution strategies for solving large-scale phase-field fracture problems*, in PASC 23, **2023**.

[79] ——, *Franetg – fracture network growth*, in PASC 24, **2024**.

[80] G. Marchi, H. Kothari, R. Krause, A. Nelson, P. Vassilevski, and P. **Zulian**, *Shifted–penalty multigrid for contact*, in International Conference on Domain Decomposition Methods (DD 29), **2025**.

[81] M. G. C. Nestola, B. Becsek, H. Zolfaghari, P. **Zulian**, O. Dominik, and K. Rolf, *AV-flow: a software library for FSI simulations of the heart valves*, in TRM Forum, Lugano, dec **2017**.

[82] S. Riva and P. **Zulian**, *GPU-accelerated fluid-structure interaction resampling in FEM, including application of 3-dimensional 4th-order WENO*, in PASC Conference, 2025.

[83] P. **Zulian**, A. Kopaničáková, M. G. C. Nestola, and R. Krause, *Open-source software library for non-conforming domain decomposition methods targeting computational energy*, in SCCER-FURIES Annual conference, **2019**.

[84] P. **Zulian**, M. Nestola, H. Kothari, A. Masero, M. M. Alloush, L. Mangani, F. Wermelinger, E. Casartelli, and R. Krause, *Immersed domain approach for fluid-structure-contact interaction problems*, in 11th Contact Mechanics International Symposium (CMIS), **2024**.

[85] P. **Zulian**, M. G. C. Nestola, A. Kopaničáková, and R. Krause, *Fluid-structure interaction methods and software libraries for in-silico analysis of the aortic heart valve*, in TRM Forum, **2019**.

[86] P. **Zulian**, M. G. C. Nestola, and R. Krause, *Fictitious domain method for 3D FSI simulations of turbines*, in SCCER - FURIES Annual Conference, **2017**.

[87] P. **Zulian**, M. G. C. Nestola, P. Shaeddle, D. Vogler, L. Karagyaur, S. Bhopalam, A. Ebigbo, M. O. Saar, , and R. Krause, *Non-conforming mesh models for flow in fractured porous media using the method of Lagrange multipliers*, in SCCER - SoE annual conference, **2018**.

[88] P. **Zulian**, M. G. C. Nestola, C. von Planta, and R. Krause, *A fictitious domain method for fluid-structure interaction*, in SCCER - FURIES annual conference, **2018**.

Open-source software

[89] P. **Zulian**, *ParMOONoLith: parallel intersection detection and automatic load-balancing library. Git repository*. https://bitbucket.org/zulianp/par_moonolith, **2016**.

[90] P. **Zulian**, D. Ganellari, and G. Rovi, *MARS - Mesh Adaptive Refinement for Supercomputing. Git repository*, **2018**.

[91] P. **Zulian**, A. Kopaničáková, M. C. G. Nestola, A. Fink, N. Fadel, A. Rigazzi, V. Magri, T. Schneider, E. Botter, J. Mankau, and R. Krause, *Utopia: A C++ embedded domain specific language for scientific computing. Git repository*. https://bitbucket.org/zulianp/utopia, **2016**.

[92] P. **Zulian** and D. Ramelli, *SGRID: a structured grid manager for supercomputing*. https://bitbucket.org/zulianp/sgrid, **2020**.

Supervised theses

[93] B. Amare, *High-performance rotations of multidimensional signals using spectral schemes*, **2024**. Master thesis. Advisors: Diego Rossinelli, Patrick **Zulian**, Rolf Krause.

[94] I. Arini, *Benchmarking for computational contact mechanics*, **2018**. Bachelor thesis. Advisor: Rolf Krause. Co-advisors: Maria Nestola, Patrick **Zulian**.

[95] P. Benedusi, *Scalable Space–Time Multilevel Solvers with Application to Electrophysiology: Theory and Parallel Implementation*, PhD thesis, Università della Svizzera italiana, **2020**. PhD thesis. Advisor: Rolf Krause. Mentor: Patrick **Zulian**.

[96] F. Cesana, *Python front-end for utopia with algorithmic implementations related to financial machine learning*, **2021**. Bachelor thesis. Advisor: Rolf Krause. Co-advisors: Kopaničáková, Alena, Patrick **Zulian**.

[97] G. M. Delparente, *Wall shear stress in the aorta computed with elastic and rigid models*, **2022**. Master thesis. Advisor: Matteo Semplice, Rolf Krause. Co-Advisor: Patrick **Zulian**, Diego Rossinelli, Maria Nestola.

[98] N. Hassanjanikhoshkroud, *A thermal-fluid-structure interaction formulation based on the fictitious domain method: Simulation studies with applications to geophysical phenomena*, **2020**. Master thesis. Advisor: Rolf Krause. Co-advisors: Maria Nestola, Patrick **Zulian**, Harald Köstler.

[99] L. Karagyaur, *4D space-time adaptivity for finite element simulations of the heat equation*, **2020**. Master thesis. Advisor: Rolf Krause. Co-Advisor: Patrick **Zulian**.

[100] X. Lin, *Towards cloth simulation with physics informed neural networks*, **2024**. Master thesis. Advisors: Patrick **Zulian**, Pietro Benedusi, Rolf Krause.

[101] B. Ma, *High-performance kernels for semi-structured finite element discretizations*, **2024**. Master thesis. Advisors: Patrick **Zulian**, Rolf Krause.

[102] D. Ramelli, *Rotation of multi-dimensional signals with spectrally accurate schemes*, **2023**. Master thesis. Advisors: Diego Rossinelli, Patrick **Zulian**, Rolf Krause.

Teaching

[103] W. Binder, *Advanced programming and design*. Università della Svizzera italiana, Faculty of Informatics, **2012**. MSc course, Teaching Assistant.

[104] ——, *Advanced programming and design*. Università della Svizzera italiana, Faculty of Informatics, **2013**. MSc course, Teaching Assistant.

[105] P. Fraternali and D. Martinenghi, *Business intelligence*. Università della Svizzera italiana, Faculty of Informatics, **2014**. MSc course, Teaching Assistant.

[106] R. Krause, M. Favino, and P. **Zulian**, *Software atelier: Partial differential equations*. Università della Svizzera italiana. Faculty of Informatics, **2021**. MSc course, Lecturer.

[107] I. Pivkin, *Linear and nonlinear multiscale solution techniques*. Università della Svizzera italiana, Faculty of Informatics, **2014**. MSc course, Teaching Assistant.

[108] P. Sanan and O. Schenk, *Software engineering for computational science*. Università della Svizzera italiana. Faculty of Informatics https://bitbucket.org/psanan/sefcs2015/src/master/, **2015**. PhD and MSc course, Teaching Assistant.

[109] P. **Zulian**, *"Schweizer Jugend Forscht: Study week" : Real-time n-body computer simulations using OpenCL and OpenGL*. Advanced high-school course, **2013**. Lecturer.

[110] ——, *"Special Days: LiLu2" : N-body computer simulations using OpenCL and OpenGL*. Advanced high-school course, **2013**. Lecturer.

[111] ——, *"Schweizer Jugend Forscht: Study week" : Real-time n-body computer simulations using OpenCL and OpenGL*. Advanced high-school course, **2014**. Lecturer.

[112] ——, *"Special Days: LiLu2" : N-body computer simulations using OpenCL and OpenGL*. Advanced high-school course, **2014**. Lecturer.

[113] ——, *Laboratorio "COESI" : Parallel computing with OpenCL*. One day course about programming simple parallel simulations with OpenCL designed for high-school teachers, **2015**. Lecturer.

[114] P. **Zulian** and G. Elefante, *Numerical programming*. Università della Svizzera italiana. Faculty of Informatics, 2025. BSc course, Lecturer.

Grants

[115] T. Driesner, R. Krause, and P. **Zulian**, *Franetg - fracture network growth*. https://www.pasc-ch.org/projects/2021-2024/franetg/, **2021**. Co-Principal investigator.

[116] T. Driesner, S. Wiemer, R. Krause, and D. Giardini, *Faster: Forecasting and assessing seismicity and thermal evolution in geothermal reservoirs*. https://www.pasc-ch.org/projects/2017-2020/faster, **2020**. Lead writer of extension proposal and contributor to the project scientific report. Extension granted.

[117] R. Krause, M. Jaggi, F. Del Grande, and S. Rizzo, *Exatrain*. https://www.pasc-ch.org/projects/2021-2024/exatrain/, **2021**. Scientific partner and proposal contributor.

[118] L. Mangani and P. **Zulian**, *Immersed methods for fluid-structure-contact-interaction simulations and complex geometries (snf 200021_215627)*, **2023**. Co-principal investigator. Funded 754364 CHF (50% to group Zulian). Project partners: Rolf Krause, Diego Rossinelli, and KNF Flodos AG.

[119] K. Rolf and P. **Zulian**, *Utopia (developement, testing, and benchmarking)*, **2024**. Co-Principal investigator. One Year, 10 milion core hours on the Shaheen III supercomputer at KAUST, Saudi Arabia.

[120] P. **Zulian**, *Gpu based computational geophysics using utopia*, **2020**. Principal investigator. One Year, 20000 node hours, and 4 TB of storage. on the CSCS Piz-Daint hybrid supercomputer (Cray XC50).

[121] P. **Zulian**, *Simulation of creeping flows and structure interaction on terabyte size data*. https://www.usi.ch/en/university/info/srit/funding-opportunities/fondo-istituzionale-ricerca, **2023**. Fondo Istituzionale per la Ricerca (FIR). Università della Svizzera italiana.

[122] P. **Zulian**, E. Casartelli, and L. Mangani, *XSES-FSI: towards eXtreme scale Semi-Structured discretizations for Fluid-Structure Interaction (pasc)*, **2024**. Principal investigator. Funded 462000 CHF (50% to group Zulian). Project partners: Rolf Krause, Matteo Parsani, and KNF Flodos AG.

Organization of scientific events and seminars

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