

# Stanford

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## Alexander D. Kaiser

Research Engineers, Pediatrics - Cardiology

 Curriculum Vitae available Online

### Bio

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#### BIO

Alexander D. Kaiser is a computational scientist and applied mathematician who researches modeling and simulation of heart mechanics. His doctoral work focused on the mitral valve. He currently works in the Stanford Cardiovascular Biomechanics Computation Laboratory, led by Alison Marsden, on modeling cardiac disease.

#### INSTITUTE AFFILIATIONS

- Member (Staff), Cardiovascular Institute

#### HONORS AND AWARDS

- Benchmark Capital Fellowship in Congenital Cardiovascular Bioengineering, The Wall Center, Stanford University (7/2020)
- Mechanisms and Innovation in Cardiovascular Disease, T32 training fellowship, National Heart Lung and Blood Institute, National Institutes of Health via Stanford CVI (6/2018)
- Kurt O. Friedrichs Prize for Outstanding Dissertation in Mathematics, Courant Institute of Mathematical Sciences, New York University (4/2018)
- Thomas Tyler Bringley Fellowship, Courant Institute of Mathematical Sciences, New York University (4/2016)
- Math Master's Thesis Prize, Courant Institute of Mathematical Sciences, New York University (4/2014)
- NSF Graduate Research Fellowship, National Science Foundation (4/2013)

#### EDUCATION AND CERTIFICATIONS

- Doctor of Philosophy, New York University , Mathematics (2017)
- Master of Science, New York University , Mathematics (2013)
- Bachelor of Arts, University of California, Berkeley , Mathematics (2009)

#### LINKS

- Personal site: <https://alexkaiser.github.io/>

### Professional

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#### PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Postdoctoral scholar, Institute for Computational & Mathematical Engineering, Stanford University (2017 - 2022)

### Publications

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#### PUBLICATIONS

- **Controlled Comparison of Simulated Hemodynamics Across Tricuspid and Bicuspid Aortic Valves.** *Annals of biomedical engineering*  
Kaiser, A. D., Shad, R., Schiavone, N., Hiesinger, W., Marsden, A. L.

2022

- **Modeling the mitral valve.** *International journal for numerical methods in biomedical engineering*  
Kaiser, A. D., McQueen, D. M., Peskin, C. S.  
2019: e3240
- **Comparison of Immersed Boundary Simulations of Heart Valve Hemodynamics Against In Vitro 4D Flow MRI Data.** *Annals of biomedical engineering*  
Kaiser, A. D., Schiavone, N. K., Elkins, C. J., McElhinney, D. B., Eaton, J. K., Marsden, A. L.  
2023
- **DynaRing: A Patient-Specific Mitral Annuloplasty Ring With Selective Stiffness Segments.** *Journal of medical devices*  
Frishman, S., Kight, A., Pirozzi, I., Maddineni, S., Imbrie-Moore, A. M., Karachiwalla, Z., Paulsen, M. J., Kaiser, A. D., Woo, Y. J., Cutkosky, M. R.  
2022; 16 (3): 031009
- **A design-based model of the aortic valve for fluid-structure interaction.** *Biomechanics and modeling in mechanobiology*  
Kaiser, A. D., Shad, R., Hiesinger, W., Marsden, A. L.  
2021
- **Patient-Specific Computational Fluid Dynamics Reveal Localized Flow Patterns Predictive of Post-Left Ventricular Assist Device Aortic Incompetence.** *Circulation. Heart failure*  
Shad, R., Kaiser, A. D., Kong, S., Fong, R., Quach, N., Bowles, C., Kasinpila, P., Shudo, Y., Teuteberg, J., Woo, Y. J., Marsden, A. L., Hiesinger, W.  
2021: CIRCHEARTFAILURE120008034
- **Use of patient-specific computational models for optimization of aortic insufficiency after implantation of left ventricular assist device.** *The Journal of thoracic and cardiovascular surgery*  
Kasinpila, P. n., Kong, S. n., Fong, R. n., Shad, R. n., Kaiser, A. D., Marsden, A. L., Woo, Y. J., Hiesinger, W. n.  
2020
- **Gaussian-Like Immersed Boundary Kernels with Three Continuous Derivatives and Improved Translational Invariance**  
Bao, Y., Kaiser, A. D., Kaye, J., Peskin, C. S.  
arXiv preprint. <https://arxiv.org/abs/1505.07529v3>.  
2017
- **Automated simplification of large symbolic expressions** *JOURNAL OF SYMBOLIC COMPUTATION*  
Bailey, D. H., Borwein, J. M., Kaiser, A. D.  
2014; 60: 120–36
- **TORCH - Computational Reference Kernels: A Testbed for Computer Science Research**  
Kaiser, A. D., Williams, S., Madduri, K., Ibrahim, K., Bailey, D. H., Demmel, J. W., Strohmaier, E.  
Tech Report LBNL-4172E. <https://escholarship.org/uc/item/8n36z5tn>.  
2010
- **A Kernel Testbed for Parallel Architecture, Language, and Performance Research**  
Strohmaier, E., Williams, S., Kaiser, A., Madduri, K., Ibrahim, K., Bailey, D., Demmel, J. W., Simos, T., Psihoyios, G., Tsitouras, C.  
AMER INST PHYSICS.2010: 1297–1300
- **A Principled Kernel Testbed for Hardware/Software Co-Design Research** *USENIX Workshop on Hot Topics in Parallelism*  
Kaiser, A. D., Williams, S., Madduri, K., Ibrahim, K., Bailey, D. H., Demmel, J. W., Strohmaier, E.  
2010
- **Undetected Errors in Quasi-cyclic LDPC Codes Caused by Receiver Symbol Slips** *Proceedings of IEEE Global Conference on Communications*  
Kaiser, A. D., Dolinar, S., Cheng, M. K.  
2009