

# Kenneth L. Ho

2223 33rd Ave., San Francisco, CA 94116

Email: klho@alumni.caltech.edu | Phone: (510) 972-4702 | Web: <http://klho.github.io>

---

## Academic and Employment History

08/2015 –	Sr. Engineer, TSMC, San Jose, CA
01/2013 – 07/2015	NSF Postdoctoral Fellow, Mathematics, Stanford University
09/2012 – 12/2012	Visiting Scholar, Courant Institute, NYU
08/2012	Visiting Scholar, Theoretical Systems Biology, Imperial College London
06/2012 – 08/2012	Assistant Research Scientist, Courant Institute, NYU
05/2012	Ph.D., Computational Biology (Mathematics), Courant Institute, NYU
10/2011 – 02/2012	Consultant, Schrödinger, New York, NY
06/2010 – 09/2010	Intern, Schrödinger, New York, NY
06/2007	B.S. (with honor), Applied and Computational Mathematics, Caltech
09/2006 – 12/2006	Affiliate Student, Mathematics, University College London

---

## Technical Summary

- Broad knowledge of applied mathematics, computer science, statistics, biology, and chemistry
- Research expertise in fast multipole methods, fast direct solvers, structured matrices; numerical analysis, scientific computing, computational physics; mathematical modeling, computational biology, systems biology; computational chemistry, electrostatics, molecular modeling
- *Computing*: C, C++, Fortran, Julia, MATLAB, Octave, Python
- *Awards*: NSF graduate and postdoctoral fellowships, NYU dissertation award, Caltech merit award
- 10+ peer-reviewed publications, 42 conference/seminar presentations, 3 open-source codes

---

## Publications

15. E. Gross, B. Davis, K.L. Ho, D.J. Bates, H.A. Harrington. Numerical algebraic geometry for model selection. Preprint, arXiv:1507.04331 [q-bio.QM].
14. V. Minden, A. Damle, K.L. Ho, L. Ying. A technique for updating hierarchical skeletonization-based factorizations of integral operators. Preprint, arXiv:1411.5706 [math.NA].
13. Y. Li, H. Yang, E.R. Martin, K.L. Ho, L. Ying. Butterfly factorization. Multiscale Model. Simul. 13 (2): 714–732, 2015. doi:10.1137/15M1007173.
12. K.L. Ho, L. Ying. Hierarchical interpolative factorization for elliptic operators: differential equations. Comm. Pure Appl. Math., 2015. doi:10.1002/cpa.21582.
11. K.L. Ho, L. Ying. Hierarchical interpolative factorization for elliptic operators: integral equations. Comm. Pure Appl. Math., 2015. doi:10.1002/cpa.21577.
10. K.L. Ho, L. Greengard. A fast semidirect least squares algorithm for hierarchically block separable matrices. SIAM J. Matrix Anal. Appl. 35 (2): 725–748, 2014. doi:10.1137/120902677.
9. L. Greengard, K.L. Ho, J.-Y. Lee. A fast direct solver for scattering from periodic structures with multiple material interfaces in two dimensions. J. Comput. Phys. 258: 738–751, 2014. doi:10.1016/j.jcp.2013.11.011.
8. K.L. Ho. Fast direct methods for molecular electrostatics. Ph.D. thesis, New York Univ., 2012.
7. H.A. Harrington, K.L. Ho, T. Thorne, M.P.H. Stumpf. Parameter-free model discrimination criterion based on steady-state coplanarity. Proc. Natl. Acad. Sci. U.S.A. 109 (39): 15746–15751, 2012. doi:10.1073/pnas.1117073109. PMID:22967512.
6. K.L. Ho, L. Greengard. A fast direct solver for structured linear systems by recursive skeletonization. SIAM J. Sci. Comput. 34 (5): A2507–A2532, 2012. doi:10.1137/120866683.

5. J.A. Bell, K.L. Ho, R. Farid. Significant reduction in errors associated with nonbonded contacts in protein crystal structures: automated all-atom refinement with *PrimeX*. Acta Cryst. D68: 935–952, 2012. doi:10.1107/S0907444912017453. PMID:22868759.
4. K.L. Ho, H.A. Harrington. Bistability in apoptosis by receptor clustering. PLoS Comput. Biol. 6 (10): e1000956, 2010. doi:10.1371/journal.pcbi.1000956. PMID:20976242.
3. H.A. Harrington, K.L. Ho, S. Ghosh, KC Tung. Construction and analysis of a modular model of caspase activation in apoptosis. Theor. Biol. Med. Model. 5: 26, 2008. doi:10.1186/1742-4682-5-26. PMID:19077196.
2. S. DeSalvo, J. Essen, K.L. Ho, G. Knight. A method for designing impulsive low-energy transfers between the Earth and the Moon using invariant manifolds. RIPS report, Inst. Pure Appl. Math., 2006.
1. K.L. Ho. Computational modeling and quantitative analysis of an *in vitro* DNA transcriptional switch system based on experimental data. SURF report, Calif. Inst. Technol., 2005.

---

## Presentations

- *Conferences and workshops*: SIAM CSE15; WYRMB 2014; SIAM AN14; FACM 2014; SIAM UQ14; BIRS Workshop on Integral Equations, 2013; SIAM CSE13; NYU/Columbia RTG Symp., NYU, 2012; SIAM LS12; SIAM AN12; SIAM ALA12; CJR, Yale, 2012; DOE Appl. Math. Prog. Meet., 2011; Courant 75th Anniv., NYU, 2011; COB Day, NYU, 2009; NSF IGERT PI Meet., 2009; Bioeng. Bootcamp, Caltech, 2008; Summer Grad. Prog., MBI, 2007; RIPS-IPAM 2006; SURF Semin. Day, Caltech, 2005
- *Seminars and colloquia*: Argonne Natl. Lab., CMU (2), Caltech, Colorado State, Imperial College London (2), JPL, LBL, NCSU, NJIT, NYU (4), Stanford, Theranos, U. Minnesota, U. Wisconsin-Madison, UC Irvine (2), UC Riverside

---

## Codes

All codes hosted at <http://klho.github.io> unless noted otherwise.

4. LowRankApprox.jl: fast low-rank matrix approximation (LowRankApprox.jl)
3. FLAM: fast linear algebra in MATLAB (FLAM)
2. PyMatrixID: fast interpolative decompositions in Python (PyMatrixID)
  - merged into SciPy as `scipy.linalg.interpolative`
1. hypoct: hyperoctree construction and manipulation (hypoct)