



**Olaf O. Storaasli, PhD 757-553-0333**

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: [Storaasli](#)

### Education

Edinburgh University	EPCC PostDoc Academic Fellow	2008
Norwegian Technical University	NASA PostDoc Fellow, NTNU, Norway	1984-85 (+89, 92, 08)
North Carolina State University	Engineering Mechanics/Mathematics	PhD 1970
University of South Dakota	Mathematics/Physics	MA 1966
Concordia College (MN)	Physics, Mathematics, French	BA 1964

### Positions

'12-'14	Senior Scientist, USEC, 350 Centrifuge Way, Oak Ridge, TN (CLASSIFIED)
'07-'12	Faculty Affiliate, <a href="#">Joint Institute for Computational Sciences</a> , University of Tennessee
'05-'12	Distinguished Research Scientist, <a href="#">FTG</a> , <a href="#">Oak Ridge National Laboratory</a> , Oak Ridge TN
'70-'05	Sr Research Scientist, <a href="#">Research Directorate</a> , <a href="#">NASA Langley Research Center</a> , Hampton VA
'02-'05	Graduate Faculty, <a href="#">Physics Computer Science &amp; Eng.</a> , <a href="#">Christopher Newport University</a>
'86-'89	Graduate Faculty, <a href="#">Electrical &amp; Computer Engineering</a> , George Washington University

### Experience

- International expert: 30+ years experience developing parallel methods to speed apps for [HPC](#).
- Led hardware-software-apps team: built [Finite Element Machine](#), 1<sup>st</sup> NASA parallel computer.
- Codes to solve large matrix equations rapidly: structures, EM, acoustic & DNA sequencing on:
  - Parallel-vector supercomputers (Cray & NASA Software-of-the-Year Awards)
  - Massively-parallel supercomputers (Intel, IBM, SGI)
  - Accelerated heterogeneous computers (i.e. [Field-Programmable Gate Arrays-FPGAs](#)).
- Developed/tested parallel structural analysis algorithms to speed oil platform design as NASA Fellow.
- Conceived/led NASA team to explore FPGAs to speed scientific & engineering analysis.
- \$15M award for a NASA Reconfigurable Scalable Computer for space applications: image & robotics.
- 100+ papers, 6 books, 120+ invited lectures (21 abroad) & [NASA videos](#) document research.

### Recent Work

- ORNL's CSM's Future Technologies Group: explored new algorithms & architectures (i.e. MPI, FPGA & GPU accelerators) to speed scientific supercomputing.
- Developed & sped apps on FPGA systems: ORNL (6), Cray (6), [EPCC](#) (64) & [NRL](#) (150) up to **1000X** over CPUs for climate/weather, molecular dynamics, genomics, matrix equation solution,...
- Awarded DOE (UT Science Alliance & SBIR) & USAF research contracts.
- Developed new parallel algorithms to [speed USEC's complex flow analysis](#) by **175X**.

### Awards

[American Men & Women of Science](#), [Marquis Who's Who](#), Edinburgh University EPCC Fellow, ORNL Inventor, [NASA Fellow@NTNU '84-'85](#), 11 NASA Langley + 5 NASA-wide Awards [1-5].:

1. [Viking Mars Lander](#)
2. [Space Shuttle Solid Rocket Booster redesign](#)
3. [Relational Information Management \(RIM => R:BASE\)](#)
4. NASA-U.S. Aerospace Industry Paris Air Show Exhibit
5. [IPAD-Integrated Programs for Aerospace-Vehicle Design](#) “for providing *national leadership in engineering database mgmt. research vital to integrate computer-aided design & manufacturing to improve aerospace industry productivity.*”

6. Cray's 1st [GigaFLOP Performance Award](#) at SC'89 "for solution for static displacement of the Space Shuttle Solid Rocket Booster"
7. NASA's [Software of the Year Award](#) for GPS matrix solver 10X speedup of GENOA's damage tolerance analyses for 10X larger problems.
8. [Pre-production Intel P6](#) system (worldwide competition) - key to success of new Intel Processor
9. [Starbridge FPGA Hypercomputer](#)
10. SUN Niagara2 (8-core/64-thread Server) & SUN Virtex5 FPGA UltraSPARC system
11. Concordia College [Alumni Achievement Award](#) & [Mathematics Hall of Fame](#).

### Key Publications ([more](#))

1. Storaasli et al, [USEC/DOE CLASSIFIED](#) Document, May 2014.
2. Storaasli et al, [State-of-the-Art in Heterogeneous Computing](#), Sci Prog 18 pp. 1-33, IOS Press +[PARA10](#) 2010
3. [High-Performance Mixed-Precision Linear Solver for FPGAs](#), IEEE Trans Computers 57/12, 1614-1623, 2008
4. [FPGA-based High Performance Computing](#), Int'l Supercomputing Conf, Dresden, Germany 2008
5. [Accelerating Science Applications up to 100X with FPGAs](#), Proc [PARA08](#), Trondheim Norway 2008
6. [Computation Speed-up of Complex Durability Analysis of Large-Scale Composite Structures](#), 49th AIAA SDM Conf, Schaumburg, IL 2008
7. [Accelerating Genome Sequencing 100-1000X](#), MRSC. Queen's Univ, Belfast, UK +[ORNL](#) 2008
8. [Exploring Accelerating Science Applications with FPGAs](#), NCSA/RSSI, Urbana, IL 2007
9. [Performance Evaluation of FPGA-Based Biological Applications](#), Cray Users Group, Seattle 2007
10. [Sparse Matrix-Vector Multiplication Design on FPGAs](#), 15th IEEE Symp on FCCM, 349-352, 2007
11. [Computing at the Speed of Thought](#), Aerospace America 35-38 2004 +[NASA](#)
12. [Engineering Applications on NASA's FPGA-based Hypercomputer](#), 7th MAPLD, Washington, D.C. 2004

### Key Books edited by Olaf Storaasli

1. Large-Scale Analysis, Design and Intelligent Synthesis Environments, [Elsevier Sciences](#), 2000.
2. Large-Scale Analysis & Design on High-Performance Computers & Workstations, [Elsevier Sciences](#), 1998.
3. Large-Scale Structural Analysis for High-Performance Computers & Workstations, [Pergamon Press](#) 1994.
4. Parallel Computational Methods for Large-Scale Structural Analysis & Design, [Pergamon Press](#) 1993.
5. Parallel Methods on Large-Scale Structural Analysis & Physics Applications, [Pergamon Press](#) 1991.

### Advisor-Sponsor

- Ph.D Thesis Advisor: Junqing Sun, [UT \(SC07 1st place award\)](#), Robert Bjærum, [NTNU](#), Norway
- Postdocs(6), [UVA](#) (5), [Duke](#) (4), [ODU](#) (4), [Univ of Colorado](#) (3), [23 Students@NASA](#) +[SC mentor](#)

### Member

[IEEE](#), [AIAA](#) (Associate Fellow), [OpenFPGA](#) & [NSF CHREC](#) (Founding Member/Officer), Conference Organizing Committees: [MRSC09 \(Berlin\)](#), [PPAM09 \(Poland\)](#), [HPRCTA'08@SC08](#), [RSSI/SAAHPC](#)

### Interests

Parallel methods (MPI, OpenMP, accelerators & performance tools) to speed HPC solution of large-scale science-engineering apps. Work with scientists & engineers to speed solution of challenging apps.

### References

[NASA](#), [Norway](#), [Supercomputing Pioneers \(ballad\)](#), [LinkedIn](#) Clearances: [DoD-NASA](#), [DoE-ORNL+USEC](#)

### Activities - Fit

[NASA Langley Alumni Assn](#), [Vikings of the Smokies](#), [Beekeeping](#), [Compute](#), [Travel](#), Read, Skate, Bike & [Swim](#) (4 miles =131 laps Nov 15, 2022 in Oak Ridge Pool). Mom's Norsk genes: clear mind & great health @103.

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