

David B. Hon Principal Dev, DevOps SRE and Systems Engineer

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<https://s3.amazonaws.com/vizhon/honres2021.html> and dbhon@linkedin and [hackerrank](#)

Also please view some of my [NASA/GSFC-SVS](#) videos archived at: [SVS-68](#) [SVS-73](#) [SVS-74](#); and [my all-time favorite annual review letter.](#))

Work Experience Summary:

[RHEL/CentOS/AtomicHost](#) and [Ubuntu](#) Cloud systems platform dev, [DevOps](#) and [SRE](#) using [Python](#), [Ansible](#) and [Terraform](#) for [VMware](#), [VirtualBox](#), [KVM](#), [Openstack](#) and [Cloudstack](#): [CDN](#), [Life Sciences Biotech](#) and [Astrophysics](#) and [Earth Physics](#) Systems. Architecture and software development for a wide range of applications and systems at NASA: Mission science data systems for the [COsmic Background Explorer \(COBE\)](#), the [X-Ray Timing Explorer \(RXTE\)](#), [Astro-H](#), and the [Earth Observing System Data and Information System \(EOSDIS\) Core System](#). Implemented and commissioned real-time instrument control and data acquisition software systems for facility instruments at the [Gemini observatories](#) and telescopes at [Kitt Peak](#) and [Mount Hopkins](#), with the [University of Florida Department of Astronomy](#). [Remote Sensing](#) ([near-IR](#) and [mid-IR](#), [X-Ray](#), [Microwave](#), [High Energy Physics](#), and [SAR](#)), [SCADA](#) and [Scientific Visualization](#). Co-founded the [Scientific Visualization Studio](#) and supported the [Global Climate Change Data Center](#) at [NASA's Goddard Space Flight Center](#), including the in-house developed [Giovanni visualization and analysis suite](#). Prototyped [JEE Institutional Repository system](#) for [NOAA's central library](#), and evaluated modern [Agile Open-Source software solutions](#) and [Cloud IaaS](#) for new missions at [NASA/Goddard](#).

Education:

[Johns Hopkins University](#), Baltimore, MD, **MA Physics** ([Elementary Particles-Experimental High Energy](#) PhD leave of absence)

[Columbia University](#), New York, NY, **BS Applied Physics**

Keywords:

[DevOps/CloudOps](#) using [Canary Deployments](#): [Apache libcloud](#) and [Terraform AWS](#) ([EC2](#), [ECS](#), [EBS](#), [Beanstalk](#), [S3](#), [SNS](#), etc), [Openstack](#), [Cloudstack](#); [Docker Containers](#) and [VMs with libguestfish](#) / [Supermin](#) and [NASA Cloud computing](#), [UNIX](#) ([Linux](#), [Solaris](#), [VxWorks](#)) near real-time with [POSIX](#) and [ANSI/ISO](#) standards. [Linux VLANs](#) and [OSI Layer-2 managed switches](#). [Service Oriented Architecture \(SOA\)](#), [Message Oriented Middleware \(MOM\)](#), [Open Archival Information Systems \(OAIS\)](#) and [Open Archive Initiative \(OAI\)](#) systems via [Duraspace](#). [REST Web Services \(LAMP\)](#) with [Apache Mod Python](#), [Python Flask](#), [Apache Tomcat JEE](#), [Node.js Express.js](#), [Socket.io](#), [jQuery](#), [HTML5](#); [JSON-LD](#) and [RDF/XML](#); search with [Solr](#), [Swish-e](#). Networked (with custom device-drivers) instrument/observatory control systems with [EPICS](#) and [VxWorks](#), [Solaris](#), [Linux](#); [TCP/IP](#), [BSD/XPG Sockets](#), [Sys. V & POSIX IPC](#) ([semaphores](#), [shared memory](#), [FIFO-pipes](#)), [pthreads](#). [Unified Modeling Language \(UML\)](#) Design. [Object Oriented Programming \(OOP\)](#) with [G++](#), [C++/STL](#) ([RogueWave](#), [Boost](#)), [Root/CInt](#), [Java Groovy](#) ([JEE](#), [JDBC](#), [Swing](#), etc.), [Python](#) ([IPython](#)), and [Ruby](#) ([Jruby](#)) with bindings to C/C++ code via [Swig](#). [Distributed Computing and Scientific Programming and Scientific Visualization](#). [Data acquisition, reduction and analysis, modeling](#); Databases: [PostgreSQL](#), [MySQL](#), [Sybase](#). [Configuration Management \(CM\)](#) with [Ansible](#), [GitHub](#), [Subversion](#), [GNU Make](#), [Ruby Rake](#), and [Node.js Jake](#). [Desktop GUIs](#) with [Java-Swing](#); [GIS](#) with [Leaflet](#) and [OpenLayers](#); [3D](#)

Graphics with [WebGL](#) and custom [Ray-Tracing](#). Scripting with [Perl](#), [Bash](#), [TCsh](#) and [Ksh](#). Other: [IDL](#) ([PV-Wave](#), [GDL](#)), [Fortran](#).

(2018-2020) Verizon Digital Media Services Platform Dev and SRE

Evolution and Sustaining engineering of the VDMS [CDN](#): system monitoring, software updates and deployments across global [POPs](#) using in-house scripts (Bash, Python, Perl, [Sar](#), [ELK](#)). Testing and debugging in-house high performance C++ [proxy](#) and [web-server](#). Hybrid cloud configuration with [AWS](#) with [MFA](#), and [Openstack](#) using [Terraform](#), [aws-cli](#), and [openstack-cli](#) to provide virtual POP [VMs](#) for system development and test.

(2016-2018) University of Florida ICBR Lead Scientific Systems Developer

DevOps/CloudOps with [Cloudstack](#); and [Openstack](#) using [OpenvSwitch](#) with [KVM-libvirt](#) on RHEL6-7 and [Atomichost](#); Custom [Docker Containers](#) and [VM images with libguestfish / Supermin](#); Python CLIs [Apache libcloud](#) and [CloudMonkey](#); Bash v3 (Apple MAC OSX) and v4 (Linux); [VirtualBox](#) with [Vagrant](#) (Ruby) scripts; [Redmine](#) (with [Git](#)) project management and Wiki..

(2013-2015) Truelancer and startup owner of Eviz.biz

Custom web-apps. in and out of the cloud ([AWS](#), [1and1.com](#), [Wholesale Internet](#)). [Node Express.js](#), [Socket.io](#); [Python Flask Socket.io](#); [jQuery](#), [HTML5](#), [Leaflet](#) and [OpenLayers-3](#) [Open GIS](#) with [OSM](#) and [OWM](#) APIs, and [PostgreSQL](#), [PostGIS](#); load-balancing and reverse-proxy via [HAProxy](#) and [NGINX](#).

(2007-2012) NOAA-HQ (via ERT) and NASA/Goddard (via Adnet Systems, Honeywell LaborLynx, SSAI/Raytheon, and GeneraDynamics)

[Astro-H](#) instrument calibration software development using [HEASoft](#) and other APIs -- C/C++, Perl, [Hudson Continuous Integration](#), [Redmine Project Management](#) and [Wiki](#).

[MAVEN Mars Mission](#) project management -- System Engineering, Requirements Analysis, Design Reviews & Design Documents ([Groovy](#) scripts with Java APIs [PDFBox](#) and [POI](#)), [Amazon EC2](#) and [NASA Cloud IaaS](#), etc.

EOS Core System Evolution and Development -- [EED](#) systems development of the [ECHO](#) backend services; extending open-source projects [Thredds](#) and [Hyrax](#).

Prototype [Institutional Repository \(IR\)](#) at the NOAA HQ central library using the [Fedora-Commons.org](#) / [Duraspace.org](#) [Java Enterprise \(JEE\)](#) [Apache software stack](#), and standards via the [CCSDS OAIS referencel model](#), [Open Archives](#), [WorldCat SRU](#) and [Zed3950/Yaz++](#). Providing system architecture and development of specialized features (extensions to [Fedora-Commons](#)). Open-Source components [Apache Httpd](#) ([reverse proxy config.](#)) and [Tomcat](#), [PostgreSQL](#), [Solr Enterprise Search Engine](#), and APIs like [Apache Xerces](#) and [Xalan](#), [SolrJ](#), [JExcelAPI](#), [JFreeChart](#), [JWt](#), [OpenOffice JOD converter](#), etc.

[Open-Source software](#) solutions for mission operations at [NASA/Goddard](#), leveraging many of the [JEE](#) technologies used in the IR software stack, and other frameworks and APIs: [ActiveMQ](#), [Quartz Job Scheduler](#) and [Twitter4J API](#), [iTextPDF](#), etc.

[Intranet Open GIS Consortium \(OGC\) Caching Web Services](#) at [NASA Goddard's Earth Sciences Data and Information Services Center](#), using an [Apache Httpd Mod Python](#) open source foundation via [OpenLayers](#), [Mapnik](#), [Matplotlib.basemap](#), [Python Imaging Library \(PIL\)](#), [Memcached](#), and other modules, along with [VMAP](#) and [BMNG](#) datasets. Implemented elements of a [Service Oriented Architecture \(SOA\)](#) work-flow system using [Python](#), [Perl](#), and [IDL](#) components.

(1998-2007) Coordinator of Computer Applications, Univ. of Florida Astronomy Dept. Instrumentation

Developed and commissioned networked ([hard/soft](#)) [realtime instrument control and data acquisition](#) systems for the [University of Florida's Infra-Red detectors](#) at the [Gemini](#) and other Observatories ([Kitt Peak](#), [Mt. Hopkins](#), [GTC](#)) using Solaris and Linux and [VxWorks](#), [EPICS](#), [CORBA](#), [TCP/IP Socket client/server/middle-ware](#), [POSIX \(RT\)](#) system and device driver interfaces, [C++/STL](#) C, Java, Python, Perl, Tcsh, Bash, Ksh.

(6/96 - 12/98) Consultant to NASA's Earth Observing "Core" System (EOS ECS)

Satellite ground station system (C++ client/server) development on SUN, SGI and HP systems using DCE/OODCE and various class libraries from RogueWave (RWTools++, RWDBTools++) interfacing to various subsystems and Sybase DBs.

(3/93 - 6/96) Principal Systems Engineer, Hughes/STX, NASA/Goddard, Rossi X-Ray Timing Explorer (RXTE)

Developed satellite ground station Science Operations Center (SOC) software configuration management scheme based on GNU RCS and Make and shell scripts; installation and system administration of Open Source and 3rd party products. Developed key components the Science Monitoring Subsystem; completed the Mission Monitoring Subsystem. Augmented the Ingest and packet distribution (server) subsystem with "proxy servers" to support ground tests and flight ops. C++ (CenterLine's ObjectCenter for SUN and SGI's CFront), Rogue Wave's Tools++ and Math++ C++ class libraries, and the TAE+ GUI designer and C++ code generator.

(3/92 - 3/93) Lead Engineer, Harris Controls

Developed the XWindows/Motif based strip-charting and trending features of a large realtime distributed database GUI (some C code generated with Builder Xcessory) comprised of SUN and IBM workstations sharing a Harris (now G.E.) proprietary Supervisory Control And Data Acquisition / Energy Management System (SCADA/EMS).

(10/85 - 3/92) Principal Programmer/Analyst, Hughes/STX NASA/Goddard

Member of the Scientific Visualization Studio ('90-'92) -- developed novel 3D graphics applications using custom ray-trace C codes, SGI graphics library "GL/OpenGL", and data visualizations with AVS on the SGI systems (some videos archived at: [SVS-68](#) [SVS-73](#) [SVS-74](#)).

Assisted the Search and Rescue project with Synthetic Aperture data reduction and image processing applications in C and IDL and developed simple SAR simulation.

Developed ('85-89) the Differential Microwave Radiometer ([DMR](#)) subsystem of the [COBE](#) satellite ground station. Wrote algorithms for calibrating the time-series (digital filters, polynomial fits, large sparse matrix solutions) and creating the principal data product known as the "Sky-map." Relied extensively on DEC VAX/VMS cluster technology.

(11/84 - 10/85) Physicist, NRL - Ships IR Signature Project

Developed stochastic ocean surface models to simulate wind driven waves, along with a custom ray-

tracer for use with infra-red atmospheric path models and US-Navy ship models, to evaluate the total infra-red "background + ship signature".

(6/84 - 11/84) Volunteer, Computer Science Dept., Columbia University

Performed Beta testing of the first Silicon Graphics Workstations, developed 3D graphics applications and test programs for the "GL/OpenGL" SGI graphics library.

(10/83 - 6/84) Consultant, ATT Bell Labs, Murray Hill

Developed software (C/BSD 4.1 UNIX) for controlling video and digital image equipment: frame buffers and RGB cameras and write-once laser disks.

(11/81 - 10/83) Member of Technical Staff, CSC/GSFC

Analyzed Small Scientific Satellite (S³) Magnetosphere data: non-linear fits, time-series analysis, etc. using PDP-11 Fortran, DEC Datatrieve.

(9/79 - 9/81) T.A., R.A., Johns Hopkins University

T.A. general Physics, developed Monte Carlo based simulations for high energy e-, e+ collisions.

Other Qualifications (Training, Awards, Fellowships):

Harris Corporation C++ Programming Language Course,
International Imaging Systems, Image Viewing and Analysis System Software
Ampex Digital and Video Signal Processing
Hughes Peer Award
Hughes RXTE Group Achievement Award
NASA, COBE Group Achievement Award
Federal Junior Fellow (as full-time college student)

Significant Milestones:

Gemini TReCS (formerly called GatrCam) Deployment and Commissioning, Cero Pechon summit, Chile.

GTC CanariCam Preliminary Design Review, Canari Islands Spain.

Gemini FLAMINGOS-2 Conceptual Design Review, Hilo Hawaii.

Gemini T-TReCS Critical Design Review, Univ. of Florida.

Gemini T-TReCS Preliminary Design Review, Univ. of Florida.

Deployed first version of EOSDIS Core System ("Release A Testbed").

Launch of RXTE.

RXTE SOC Critical Design Review, NASA/GSFC.

Launch of COBE.

COBE Critical Design Review, NASA/GSFC.

COBE (CSDR) Preliminary Design Review, NASA/GSFC.

Significant Reports, Publications, Presentations:

"FLAMINGOS-2: the facility near-infrared wide-field imager and multi-object spectrograph for Gemini", SPIE Proceedings (New Instrument)

"Performance of the FLAMINGOS near-IR multi-object spectrometer and imager and plans for FLAMINGOS-2: a fully cryogenic near-IR MOS for Gemini South", SPIE

"CanariCam: a multimode mid-infrared camera for the Gran Telescopio CANARIAS", SPIE

"GatirCam: Gemini mid-infrared imager", SPIE

"A New Method for Visualizing Data on a Sphere", Computers in Physics.

"Introduction to the Scientific Visualization Studio at NASA/GSFC", Computer Science Colloquium, University of Central Florida.

"Interactive 3D Graphics and Volume Visualization for Zodiacal/Interplanetary Dust Modeling and COBE Data Analysis", American Astronomical Society Meeting, Albuquerque, NM.

"Visualizing Data on a Sphere", National Institute of Standards and Technology, Gaithersburg, MD.

"COBE DMR Data Reduction System", Third International Conference on Data Analysis in Astronomy, Erice, Italy.

"Ion Ring Currents in the Earth's Magnetosphere", Naval Research Laboratory, Washington DC.

"Muon Multiplicities in e^+ , e^- Collisions at 100 GeV", Stanford Linear Collider Workshop Note.

General:

Member IEEE

US Citizen, Non Veteran

Former Federal Employee (clearance level of secret), Naval Surface Weapons Center, White Oak, MD

References:

Mr. Robert Kozon, NASA/Goddard 202-543-2137

Ms. Karin Loya, LoyalT 301-785-2934

Mr. Stanley Elswick, NOAA-HQ 301-713-2607 x138

Ms. Shubha Barriga, ERT 301-323-1422 (formerly Honeywell Tech. Solns.)

Dr. John C. Mather, NASA/Goddard 301-286-6885

Dr. Christopher Packham, Univ. of Texas San Antonio 210-458-8671 (formerly UF Astronomy)

Dr. Charles Telesco, Univ. of Florida Astronomy 352-392-2052 x265

Dr. Frank Marshall, GSFC Code 662 301-286-5279

Dr. Jean Swank, GSFC Code 662 301-286-9167

Dr. Jan M Hollis, GSFC Code 630 301-286-7591

Dr. George Smoot, University of California, Berkeley 510-486-5237

Dr. Bruce Barnett, Johns Hopkins University, Baltimore Md 410-516-7382

Dr. Barry Blumenfeld, Johns Hopkins University, Baltimore Md 410-516-7358