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(https://www.synopsys.com)

# CODE V Optical Design Software

Design, optimize and fabricate superior imaging optics

Home (/) / Optical Solutions (/optical-solutions.html) / CODE V (/optical-solutions/codev.html)

CODE V optical design software is a computer aided design software used to model, analyze, optimize, and provide fabrication support for the development of optical systems for diverse applications (/optical-solutions/codev/application-gallery.html). This optical ray tracing software provides a powerful and yet easy-to-use toolkit of optical techniques and calculations that enables you to create superior designs that will work right when built.

## What's New in CODE V

CODE V includes new solutions to increase optical engineering productivity, support cost-to-manufacture savings, and give reliable results in less time.

## About the Software

CODE V overview (/optical-solutions/codev.html)

What's new (/optical-solutions/codev/codev-whatsnew.html)

Feature details (/optical-

Learn More (/optical-solutions/codev/codev-whatsnew.html)

## Key Features

CODE V has a vast array of technical, graphical, and ease-of-use features that makes it the lens design software of choice for developing superior imaging optics. The following list of key features is just a small subset of what is available.

- Design optimization (including Global Synthesis (/optical-solutions/codev/global-synthesis.html)) that speeds time to market
- Fast, accurate tolerancing for superior fabrication support
- Accurate, groundbreaking beam propagation analysis
- Extensive built-in libraries of optical system models (patents, etc.), components, and optical glasses
- Comprehensive graphics capabilities (pictures, data plots, shaded displays), including 3D visualizations and diffraction-based image simulations
- Non-sequential surface modeling for unusual systems
- Fast 2D image simulation to visualize optical system performance
- Read more features (/optical-solutions/codev/features.html)
- View applications (/optical-solutions/codev/application-gallery.html)

solutions/codev/features.html)

Application gallery (/optical-solutions/codev/application-gallery.html)

Product literature (/optical-solutions/codev/product-literature.html)

Capabilities matrix (/optical-solutions/codev/capabilities-matrix.html)

System requirements (/optical-solutions/codev/hw-systems.html)

Choosing a solution (/optical-solutions/choosing-solution.html)

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(/optical-solutions/support/

Request
(https://www.synopsys.com/cgi-bin/

## Support & Training

### Glass Expert Feature

Choose the best glasses for your optical design – automatically

Learn More (/optical-solutions/codev/glass-expert.html)

### Global Synthesis Feature

Obtain multiple design solutions in three easy steps with Global Synthesis®

Learn More (/optical-solutions/codev/global-synthesis.html)

### Beam Synthesis Propagation Feature

Groundbreaking accuracy and ease of use with Beam Synthesis Propagation™

Learn More (/optical-solutions/codev/feature-closeup.html)

Product support (/optical-solutions/support.html)

Customer support portal (https://opticsportal.synopsys.com)

Training videos (https://opticsportal.synopsys.com/C/SitePages/Training%20and%20Demo%20Videc

Training courses (/optical-solutions/s/training.html)

Consulting (/optical-solutions/engine services.html)

## Licensing & Trials

Request more information or product demo (https://www.synopsys.com/cgi-bin/optical-solutions/contact/contact1.cgi)

Contact us (/optical-solutions/support/support-global-contacts.html)

Student licenses (/optical-solutions/learn/student-

## Why Choose CODE V?

## Applications

Read how your investment with CODE V delivers unsurpassed return on investment. If you want to save your company time and money, take an in-depth look on why CODE V is the best software for optical design.

Learn More (/optical-solutions/codev/optical-design.html)

This software is used for designing imaging systems, where you are trying to image a point (or plane wave) in object space to a point (or plane wave) in image space.

Learn More (/optical-solutions/codev/application-gallery.html)

license.html)

## Download Papers

Download a brochure, other feature datasheets and white papers

Learn More (/optical-solutions/codev/product-literature.html)

## View Videos

Product demos, keynotes, technical presentations, expert panels, and more

Watch Videos (https://www.youtube.com/watch?v=6-wIkoiwvXo&index=3&list=PLEgCreVKPx5Ci_hrIfB_y93qIlS0FwlrT)

# Helpful Resources

## Compact, High-Performance Optical Design for AR, VR, and MR Systems

Laser Focus World Webcast (https://www.laserfocusworld.c /webcasts/2018/09 /compact-high-performance-optical-design-meeting-a-key-challenge-in-ar-vr-and-mr-systems.html)

## CODE V New Feature Videos

Watch videos that highlight new features in CODE V

Customer Support Portal (https://opticsportal.synopsys.c /CodeV/SitePages /CODE%20V%20New%20Featu

## "Designing Optics Using CODE V"

By Donald C. O'Shea and Julie L. Bentley

SPIE Bookstore (http://spie.org /Publications /Book/2319321)

## UPCOMING CONFERENCES

OSA Optical Design & Fabrication Congress (https://www.osa.org/en-us/meetings/osa_meetings/optical_design_and_fabrication/) ›

## What Customers Are Saying

“CODE V is an incredibly helpful tool for designing professional, high-end optics. The optimization routines are unbeatable, especially for our complex lenses with many individual optical elements. Furthermore, the solutions with CODE V’s Global Synthesis optimization lead to high-performance systems. CODE V is one of the enabling technologies that allows NWS instruments to offer imaging tools for experts.”

--Dr. Christoph Horneber, Co-Founder and Director of Optical Design, NWS Instruments AG

Download Success Story (/content/dam/synopsys/optical-solutions/documents/success-stories/nws-instruments-customer-success.pdf)

“As an optical design and engineering firm that specializes in custom precision systems, we are continuously challenged with new and demanding projects. We appreciate new features in CODE V that help us analyze, optimize, and tolerance optical systems to get into production quickly. The View Apertures (VAP) feature has been helpful in analyzing non-rotationally symmetric systems with complex apertures in both imaging and beam shaping. VAP has also been very helpful for communications between our optics and mechanics teams, as well as with our customers and suppliers.”

--Andrés Cifuentes, Chief Executive Officer, ASE Optics Europe

“We rely on the speed, stability and flexibility of CODE V's optimization capabilities to develop sophisticated optical systems. With its global optimization features, its ability to control constraints exactly, and an interface that allows us to set up user-defined merit functions quickly and easily, CODE V gives us ultimate design freedom."

--Russ Hudyma, Managing Partner, Hyperion Development LLC

"CODE V is essential for our lens design work at Nikon Research Corporation of America. We often require extraordinary correction with many surfaces, and several very high-order aspheres, resulting in too many variables for typical lens design optimization. CODE V’s optimization tools, such as Global Synthesis and Glass Expert, make it possible to successfully design such systems."

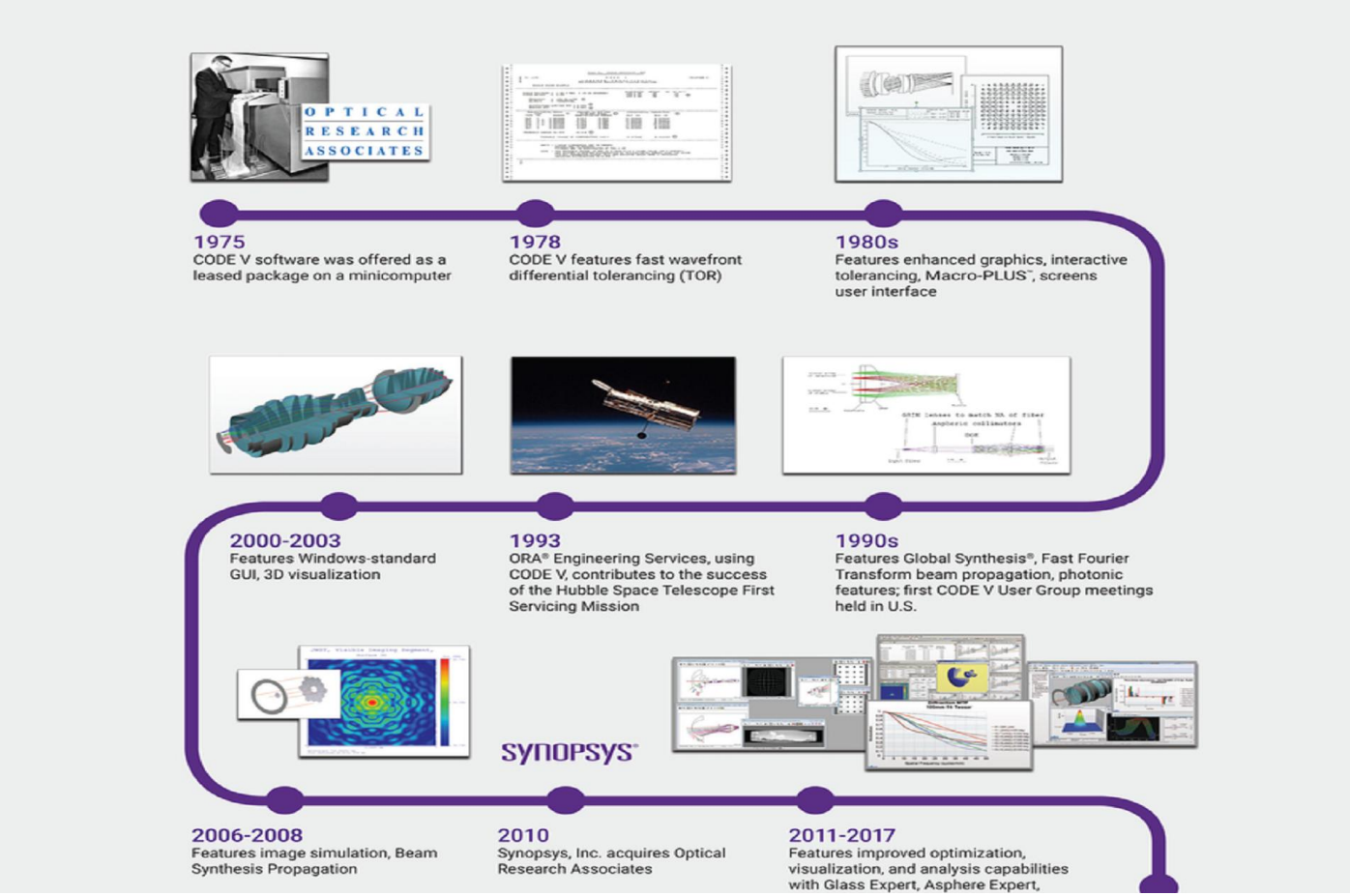
DAN SMITH, PH.D. | DIRECTOR OF OPTICAL SCIENCES AND TECHNOLOGY

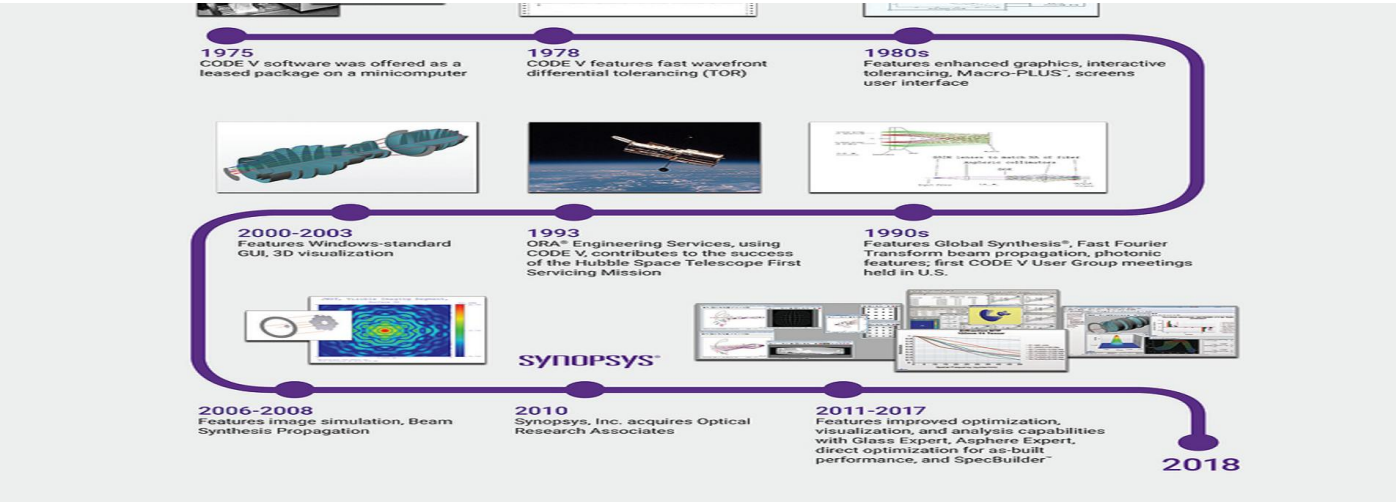
“The CODE V Image Simulation feature (/content/dam/synopsys/optical-solutions/documents/datasheets/image-simulation.pdf) provides a convenient method for evaluating optical systems that are used in unconventional

imaging environments, such as automotive surround, 3D (stereo) imaging or hyper-hemispheric imaging. We have used these tools to develop hyper-hemispheric designs and have found them to be effective in evaluating synthetic target imagery. Rather than relying on MTF and PSF plots, the diffraction-based Image Simulation helps bridge the gap between perception and engineering metrics for our clients."

--Dr. John Tamkin, Chief Executive Officer and Chief Technology Officer, Imaging Insights LLC

## Leading Optical Design Innovation for Over 40 Years






# Resources for Current Customers

## Technical Support

+1 (626) 795-9101

codev_support@synopsys.com

Learn More (/optical-solutions/support/support-codev-lighttools.html)

## Customer Support Portal

Videos, release notes, downloads, and more.

Customers may register online for an account.

Learn More (https://opticsportal.synopsys.com)

## Upcoming U.S. Training

Our Spring classes are scheduled. The next class in March. Register online to reserve your seat. Space is limited!

Learn More (/optical-solutions/support/training/codev-advanced.html)

## Glass Catalog Updates

Update the CODE V glass catalog to the latest version.

Learn More (/optical-solutions/support/support-glass-catalog.html)

Semiconductor IP (/designware-ip.html)

Verification (/verification.html)

Design (/implementation-and-signoff.html)

Silicon Engineering (/silicon.html)

Support (/support.html)

Community (/community.html)

Manage Subscriptions (https://www.synopsys.com/apps/subcenter/req1.php)

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Software Integrity (/company/legal/software-integrity.html)

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