SUPERIOR *OPTICAL DESIGN* **SOFTWARE**

OSLO

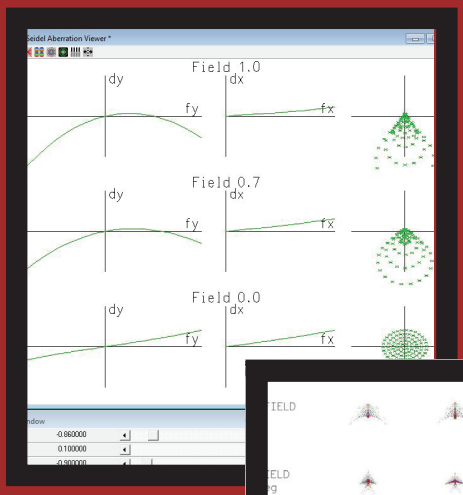
Creating Today's Innovative Solutions

OSLO® is a powerful optical design program with the scope needed to meet today's optical requirements. In addition to classical lens design features, OSLO combines advanced ray tracing, analysis, and optimization methods with a high-speed built-in compiled programming language and a separate macro language to solve a wide variety of new problems.

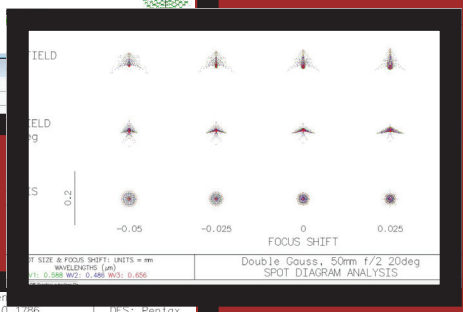
OSLO provides an integrated software environment that helps you complete almost any task in contemporary optical design. More than a lens design program, OSLO provides advanced tools for designing space telescopes (including segmented mirrors), camera lenses, zoom lenses, scanning systems, anamorphic systems, cinema systems, microscopes, ocular systems, projection systems, endoscopes, AR/VR/MR systems, photolithographic systems, mobile phone lenses, defense applications, laser systems, spectrometers, and holographic systems, to name some typical applications.

LAMBDA RESEARCH CORPORATION

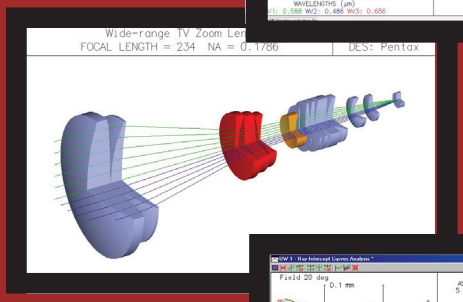
SUPERIOR *OPTICAL DESIGN* SOFTWARE



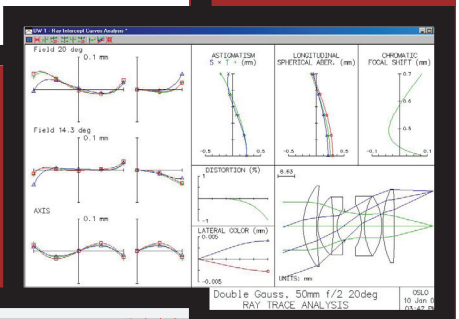
Interactive Slider Capability



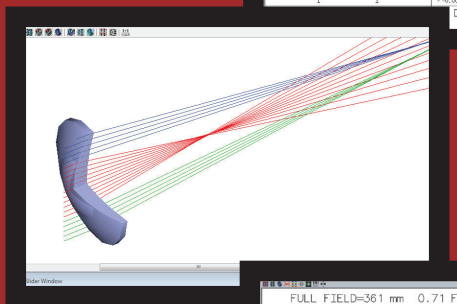
Spot Diagram Plots



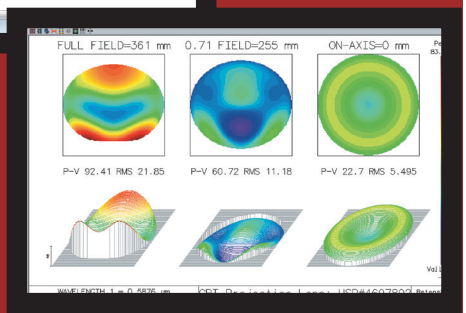
3D Shaded Solid Plots



Ray Intercept Curve Plots



Dual EFL lens with sliders to specify orientation



Wavefront Analysis Plots

Two Editions

OSLO is available in two editions: OSLO Premium, and a free educational version, OSLO EDU.

OSLO Premium is the professional edition of OSLO and includes features such as ray tracing and optimization of non-sequential groups, lens arrays, thin-film coatings, polarization ray tracing, vector diffraction calculations, true global optimization, high-speed MTF/Wavefront tolerancing, an enhanced CCL library, and optimization of eikonal functions.

OSLO EDU is designed to model and perform basic optimization on a wide variety of systems, including those with aspheric, tilted or decentered surfaces, or diffractive surfaces. Analysis capabilities include all the basic routines for both geometrical and diffraction-based evaluation, including Gaussian beam propagation and fiber coupling. OSLO EDU also includes several glass catalogs and a database containing more than 3,000 stock lenses.

Optical Design for Today's Applications

OSLO is straightforward to learn and easy to use. Developed exclusively for Windows desktop computers, its speed, power, and flexibility are unmatched by other software. And, its advanced technology is available at reasonable cost. OSLO has been accepted as a practical tool by companies throughout the world that use it to create better, lower-cost designs and manufacture them more efficiently.

From a technical viewpoint, OSLO is much more than a lens design program. Because of its powerful ray-tracing routines and far-field diffraction analysis that computes amplitude and phase distributions near foci, practically any optical system that utilizes free-space propagation can be designed using OSLO.

OSLO's optimization is its most powerful built-in feature. Often you can optimize a system by clicking a few toolbar icons. When you need extra power, however, OSLO goes beyond typical optical design software to provide the extra control that you need. For example, in addition to several default error functions, OSLO provides extremely flexible methods for building custom internal or external error functions. These allow you to solve virtually any optimization problem that uses continuous variables.

Efficient, user-friendly programmability has become an essential tool for the professional optical designer. CCL, OSLO's programming language, provides high-speed compilation, standard C syntax, and full internal-accuracy data communication with OSLO. With its extensive support library, CCL allows you to extend OSLO's capabilities in new application areas.

Features that Help You Explore the Limits

Lens and Material Databases

OSLO includes one of the industry's largest libraries of materials, catalog lenses, and starting designs. In addition to materials data from all major glass suppliers, there's a database containing more than 3,000 stock lenses for setting up prototypes, and three libraries containing over 1000 starting designs for optimization. The Arthur Cox library from the book A System of Optical Design, and the Warren Smith library, from the book Modern Lens Design, are uniquely available with OSLO.

Special Surface Data

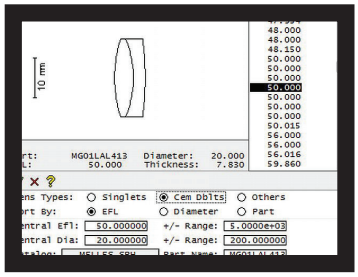
The data that OSLO uses to describe optical surfaces are complete and easily managed. Tilted and decentered surfaces are described properly, with no need for extra dummy surfaces in either local or global coordinates. Polynomial aspheric and diffractive surfaces are not limited as to order. The range of surface types available meets the state of the art and includes aspheres, splines and gradient index, diffractive, user-defined, and eikonal surfaces. Each surface type is supported by a spreadsheet to enhance ease of use, as well as a high-speed command mode that permits efficient data entry.

Apertures, Holes, and Obstructions

OSLO allows you to define multiple apertures, holes or obstructions on a single surface using combinations of elementary shapes. Almost any conceivable shape can be created. In addition, OSLO's special aperture types allow you to simulate most optical elements that can be handled in a solids program while retaining the speed and efficiency of surface modeling. This feature, combined with non-sequential ray tracing, allows OSLO to serve as a complete optical design tool.

Interoperability

OSLO allows data to be interactively exchanged between compatible Windows programs such as TracePro, Matlab, MS Excel, MS Word, etc. Operation of the DDE interface is controlled through macros. The native language of the macros depends on whether DDE is configured as a client or server— OSLO can do both.



Full Lens Vendor Catalog

Segmented Mirror Defined by Special Apertures

OSLO EDITION COMPARISON		
OSLO Edition	**EDU**	**Premium**
GENERAL SURFACE PROPERTIES		
Unlimited 3D optics, sources, surfaces, variables, & optimization targets (tilts & bends using local or global coordinates on all surfaces) with test plate libraries	NO	YES
Non-sequential groups, Regular & tabular arrays, User defined gradient, sag, eikonal and DOE	NO	YES
MULTICONFIGURATION SYSTEMS AND VARIABLES		
Zoom lens design, thermal configurations, athermal design, and nonsequential systems	NO	YES
Curvatures, thicknesses, refractive indices & apertures, aspheric, tilts, decenter variables, wavelengths, ray aiming mode, reference surfaces, aperture and FOV variables	NO	YES
STARTING DESIGN LIBRARIES		
OSLO demos & examples, vendor lens catalogs	YES	YES
Arthux Cox, Ellis Betensky, and Warren Smith libraries (705 lenses)	NO	YES
Non-sequential & special examples (37 lenses)	NO	YES
OPTIMIZATION AND TOLERANCING		
Autofocus for minimum paraxial focus, RMS spot size or OPD, Damped Least Square	YES	YES
Zernike, MTF, Powell's Method, Global Optimization, Conformal optics (Wassermann-Wolf) solve	NO	YES
Standard Surface, component and User defined tolerancing with uniform or Gaussian statistics	YES	YES
Change table tolerancing using transverse, spherical, coma, axial & field D-d, best and back focus or focal length, distortion, lateral shear, magnification, axial & field sags and RMS OPD	NO	YES
MTF/Wavefront tolerancing, Monte Carlo and Tolerance grades and Group tolerancing	NO	YES
TOOLS AND ANALYSIS		
Spot diagrams, Wavefront and Aberration analyses, Point or line spread function, Intensity output, Geometrical and diffraction based energy distribution with encircled & ensquared energy, MTF, Gausssian beam interactive analysis, Gaussian beam astigmatic trace: independent YZ and XZ analyses	YES	YES
Narcissus or ghost effects, export DXF, IGES, STEP and 10110 ISO drawings	NO	YES
SCL, CCL - compiled command language (C language syntax - w/ open source library)	YES	YES
Fiber coupling efficiency, Single-mode coupling with stepped-index or Gaussian-mode fibers	YES	YES
Test plate analysis and ranking	NO	YES
Polarization sources and analysis, Fiber Coupling with user defined mode	NO	YES
Point or line spread function, vector diffraction, DOE efficiency, multi-layer coating analysis	NO	YES

SUPERIOR *OPTICAL DESIGN* **SOFTWARE**

Free Trial Offer!

OSLO

We are Here to Help!

Since 1992, Lambda Research Corporation has developed innovative optical software programs that reduce design and prototype time in a wide variety of industries. Our products give engineers industry-standard tools and conventions for 3D virtual prototyping that eliminate the need for trial-and-error methods. Our support is outstanding with website access to a knowledge base, webinars, tutorials, and up-to-date examples, as well as support through annual contract.

Lambda Research Corporation has comprehensive technical expertise and development resources that go beyond the normal capabilities of other programs. Our programmers and optical experts can work closely with your engineers and designers to customize our OSLO product specifically to meet your needs.

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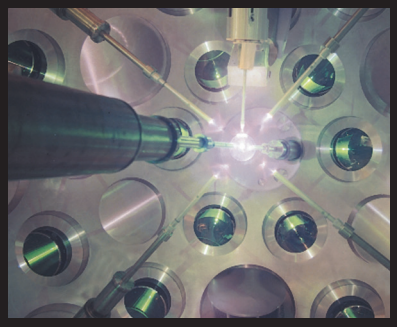
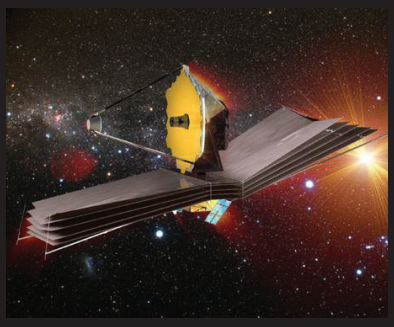
OSLO APPLICATIONS



The University of Rochester Laboratory for Laser Energetics uses OSLO extensively in the development of its Omega laser.



The James Webb Space Telescope's optical design and tolerancing was done using OSLO, photo courtesy of NASA.

Zygo Corporation, a world leader in interferometric test equipment and long-time user of OSLO, was chosen by Ball Aerospace to supply the system needed to test the Costar optics for the 1993 Hubble Space Telescope upgrade.

Leupold & Stevens, the pre-eminent manufacturer of sports optics in the United States, uses OSLO to design almost all of its products. The binoculars shown above are a new design, the first binoculars produced in the United States in more than twenty years.

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