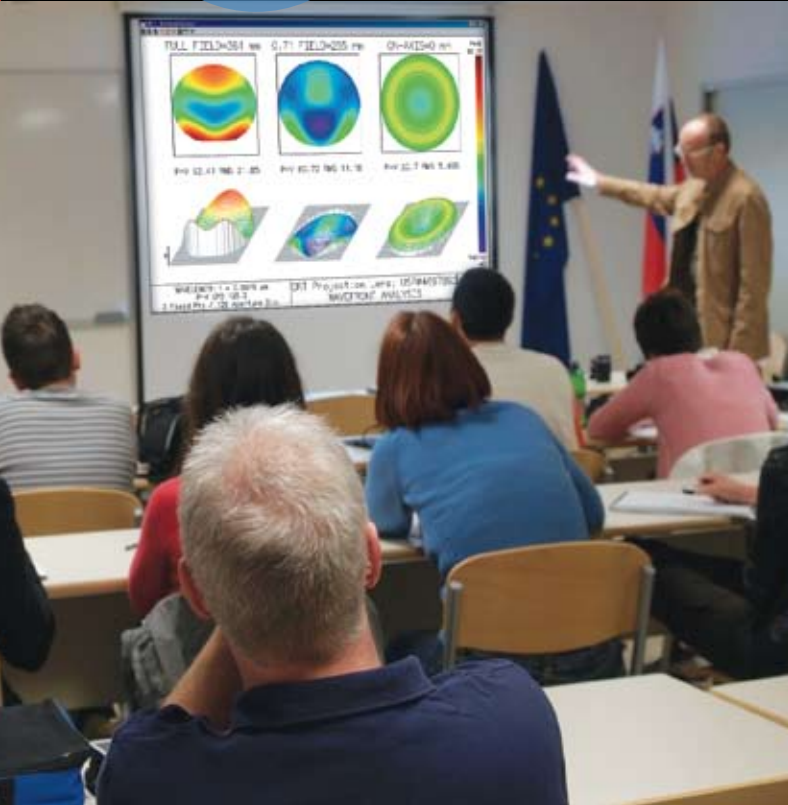


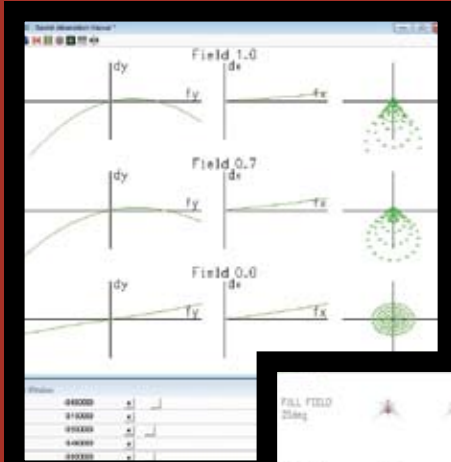
Creating Today's Innovative Solutions



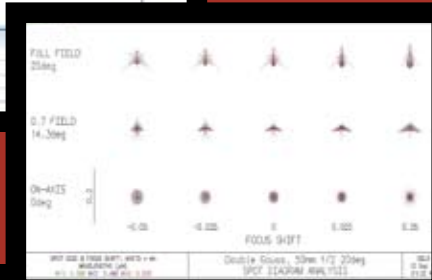
OSLO® is a powerful optical design program with the scope needed to meet today's optical requirements. In addition to classical lens design features, OSLO combines advanced ray tracing, analysis, and optimization methods with a high-speed macro language to solve a wide variety of new problems.

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 medical instrumentation, illumination systems, and telecommunications equipment, to name typical applications.

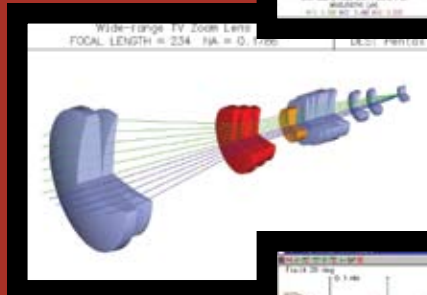
SUPERIOR OPTICAL DESIGN SOFTWARE



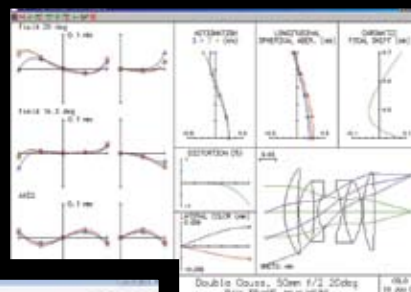
**Interactive
Slider
Capability**



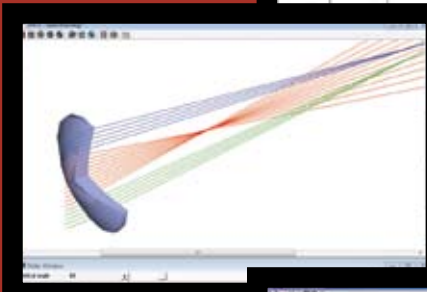
**Spot
Diagram
Plots**



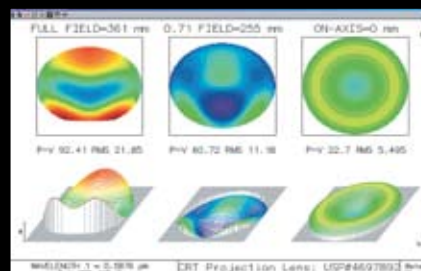
**3D Shaded
Solid Plots**



**Ray Intercept
Curve Plots**



**Dual EFL
lens with
sliders
to specify
orientation**



Wavefront Analysis Plots

Four Editions

OSLO is available in four editions, OSLO Premium, OSLO Standard, and OSLO Light, plus a free educational version OSLO EDU.

OSLO Premium is the top level 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 Standard provides optimization and tolerancing tools needed to support contemporary lens design. Its features include a very flexible automatic error function generator, multi-configuration optimization, the CCL macro development language, an expanded range of special surface types, and the Warren Smith, Arthur Cox, and Optics Toolbox libraries of starting designs.

OSLO Light is designed to model and perform basic optimization on a wide variety of systems, including those with aspheric, tilted or decentered surfaces, gradient index elements 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 Light 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.

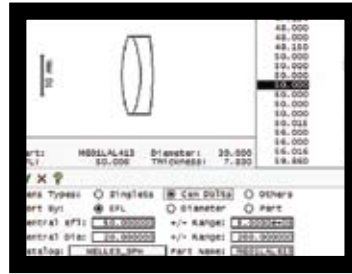
Special Surface Data

OSLO allows you to define multiple apertures, holes or obstructions on a single surface using combinations of elementary

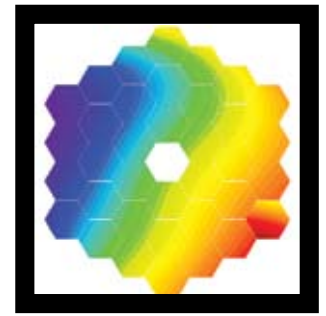
shapes. Almost any conceivable shape can be created. In addition, OSLO's special aperture types allow you to simulate most optical elements that can be handled in a solids program while retaining the speed and efficiency of surface modeling. This feature, combined with non-sequential ray tracing, allows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

Special Surface Data

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 EDITIONS COMPARISON				
OSLO Edition	Light	Standard	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	YES	YES	YES	
Non-sequential groups, Regular & tabular arrays, User defined gradient, sag, eikonal and DOE	NO	NO	YES	
MULTICONFIGURATION SYSTEMS AND VARIABLES				
Zoom lens design, thermal configurations, athermal design, and nonsequential systems	NO	YES	YES	
Curvatures, thicknesses, refractive indices & apertures, aspheric, tilts, decenter variables, wavelengths, ray aiming mode, reference surfaces, aperture and FOV variables	NO	YES	YES	
STARTING DESIGN LIBRARIES				
OSLO demos & examples (40 lenses), vendor lens catalogs (192 lenses)	YES	YES	YES	
Arthur Cox, Ellis Betensky, and Warren Smith libraries (705 lenses)	NO	YES	YES	
Non-sequential & special examples (37 lenses)	NO	NO	YES	
OPTIMIZATION AND TOLERANCING				
Autofocus for minimum paraxial focus, RMS spot size or OPD, Damped Least Square	YES	YES	YES	
Zernike, MTF, Powell's Method, Global Optimization, Conformal optics (Wassermann-Wolf) solve	NO	NO	YES	
Standard Surface, component and User defined tolerancing with uniform or Gaussian statistics	YES	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	YES	
MTF/Wavefront tolerancing, Monte Carlo and Tolerance grades and Group tolerancing	NO	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, Gaussian beam interactive analysis, Gaussian beam astigmatic trace: independent YZ and XZ analyses	YES	YES	YES	
Narcissus or ghost effects, export DXF, IGES, STEP and 10110 ISO drawings	YES	YES	YES	
SCL, CCL - compiled command language (C language syntax - w/ open source library)	YES	YES	YES	
Fiber coupling efficiency, Single-mode coupling with stepped-index or Gaussian-mode fibers	YES	YES	YES	
Test plate analysis and ranking	NO	YES	YES	
Polarization sources and analysis, Fiber Coupling with user defined mode	NO	NO	YES	
Point or line spread function, vector diffraction, DOE efficiency, multi-layer coating analysis	NO	NO	YES	



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 email and telephone 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.

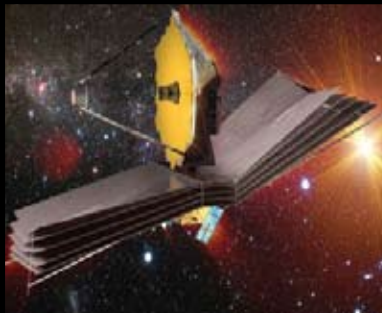
Lambda Research Corporation
25 Porter Road, Littleton MA 01460
+1 978-486-0766

www.lambdares.com
sales@lambdares.com

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.