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Optica Software™

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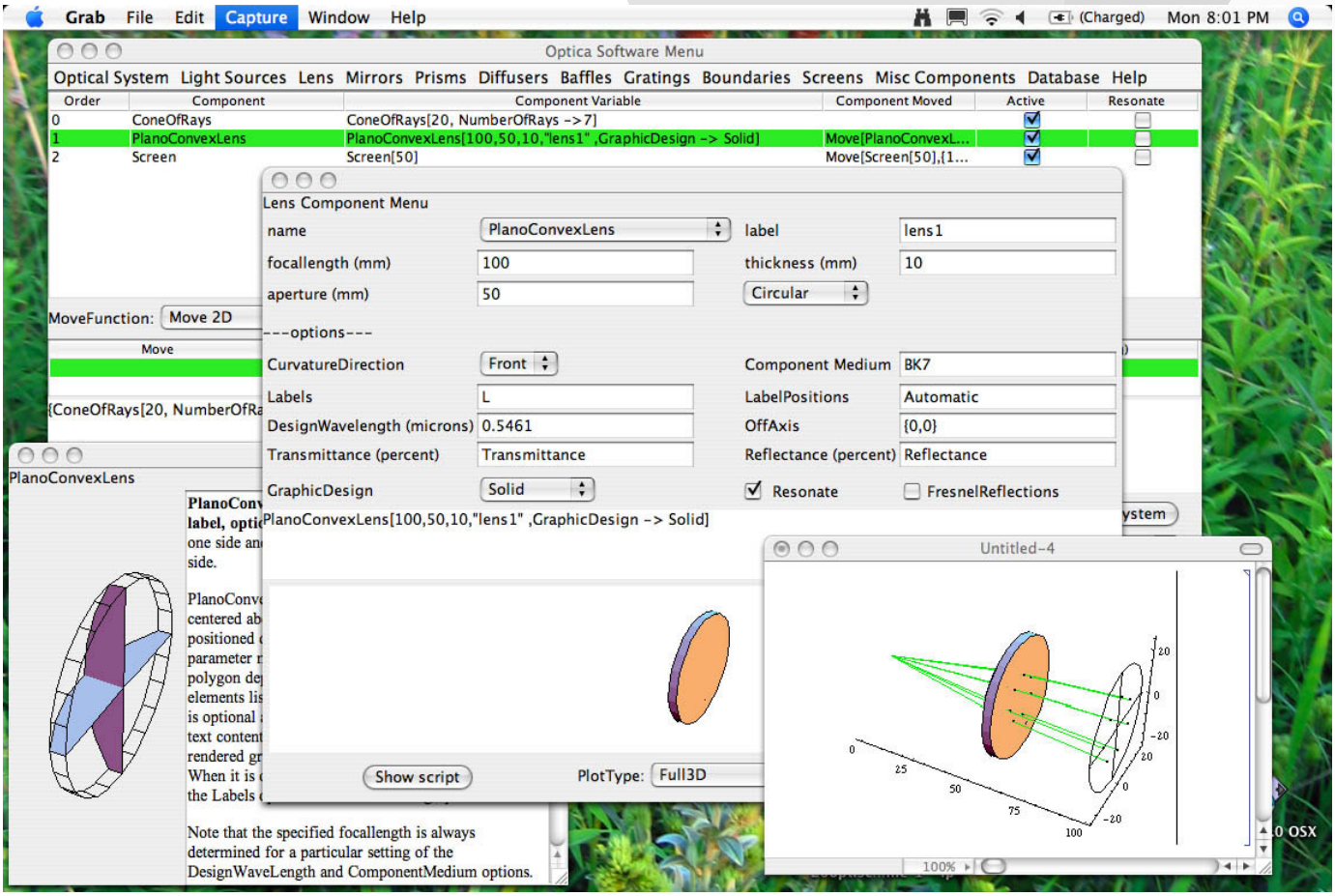
ADDRESSING THE OPTICAL DESIGN AND ANALYSIS NEEDS OF CORPORATE, BUSINESS, EDUCATIONAL, GOVERNMENTAL AND INDIVIDUAL USERS.

Optica Software News



GRAPHICAL USER INTERFACE

The graphical user interface (GUI) for *Rayica*™, *Wavica*™ and *LensLab*™ will allow users to make component and system specifications via menus, in addition to the *Mathematica*® notebook input. This should make it easier for new users to learn how to use our products. Alpha testing will begin this March, so if you are interested, please send an email to support@opticasoftware.com. After the testing period, registered Optica Software users will be able to download the GUI via our website.

Photonics West 2006 Update

A record number of attendees -- 16,533 -- and more than 1000 exhibitors participated in Photonics West 2006 in San Jose, California. According to officials from event sponsor SPIE, 2006 was the most successful year ever for the photonics industry's largest annual trade show.

Our developer, Donald Barnhart, Ph.D. has decided to write a book on optics that uses examples from *Rayica*™ and *Wavica*™. During this time we are seeking individuals who would like to contribute topics for a chapter that relates to how you use our software. Contact us for more information.

Our online survey recipient for **February 2006** is **Andrew Quirke** from the **Gray Cancer Institute**. Please continue to fill out the survey for your chance to win. For more details on how to participate please visit our homepage.

Distribution Agreement with Wolfram Research, Inc.

Wolfram Research Inc. has been added as a reseller and has begun distributing the Optica Software products. Tim Hoerr, CEO of iCyt Mission Technology, Inc., commented, "The collaboration between our two companies significantly expands the opportunity to put optical modeling tools into the hands of more users. We are excited about the distribution breadth that Wolfram Research brings to our organization." Donald Barnhart, Ph.D. and Lead Developer of the Optica Software family of products, said "Entering into a distribution agreement with Wolfram is a significant milestone for Optica Software. Our products have been integrally connected for many years. The distribution agreement is recognition that our companies plan to closely collaborate for years to come."

Site Licenses

Optica Software site licenses are attractively priced and eliminate the hassle of complicated site license administration. Whether you are interested in licensing Optica Software products for use within an academic institution, commercial, government, or non-profit organization, we have designed a site license to fit your needs and your budget. Pricing is determined by the number of users you specify. You can always purchase additional user packs as you increase the number of users.

Select your type of organization from the list below to request information on pricing and policies:

Schools: for a single department within a college or university or for use throughout the entire college or university campus.

Commercial

Government

Non-profit organizations

Projects and custom needs

We are able to modify our software to fit your custom needs. Contact us for any special requests you may have or for enhancements to our software that are not currently shown on our website. If you can visualize the application you need, we can put together a customized proposal and plan for you. Visit our Products page on the web to review the software comparison matrix to determine the features and benefits that are important to you.

Donald Barnhart, the Welsh Dragon, Lorenzo Kindle, and Lori Paulette-Dwyer from OSA have some laughs at our booth during Photonics West.

Q&A Mailbox

Q: What are some of the differences between your software and those of your competitors?

A: Our software has many features that don't exist in other products on the market. Our software is a full-fledged language for modeling optical systems. This gives you enormous control over your design process. Because our software is written in the symbolic programming environment of *Mathematica*® you can use your own parametric equations to describe optical surfaces. In addition, unlike some of our competitors, our software was written to be non-sequential from its conception.

You can perform both geometric ray-tracing and determine analytic solutions to your optical system including: Gaussian beam propagation, Fourier optics, symbolic global optimization, diffraction, and interference calculations.

Submit your questions to our Optica Software Development Team

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Rayica and *LensLab* now available in DEMO mode

Over the past few months, we have had many requests for a demonstration version of our products from potential customers. To meet this demand and to help track usage of our products, we have now implemented a password protection scheme on *Rayica*, *Wavica*, and *LensLab*. In particular, this gives potential customers access to our regular software which now operates in a demo-mode without a valid password.

For existing users, this does mean that after you install your next update of *Rayica*, *Wavica*-Bundle, or *LensLab*, you will be asked to enter a password the first time that you run the application. If you are a current user with a valid support plan, you are automatically entitled to a free password. To receive your password, simply fill out a Password Request Form on our web site with your license number and machine ID. Once you have entered the correct password, it remains valid indefinitely with no expiration date for your license number and machine ID. Please note that in spite of this new password protection, we will continue to openly share the essential source code of our products with our customers.

Exhibit Event Schedule

CLEO/QELS Conference
Long Beach, CA
May 21-26, 2006
CLEO/QELS Exhibit
Booth #T41

International Optical Design Conference
Vancouver, BC Canada
June 4-8, 2006-01-18
International Optical Design Conference Exhibit

Optics & Photonics
San Diego, CA
August 13-17, 2006
Optics & Photonics Exhibit

Frontiers in Optics
Rochester, NY
October 10-11, 2006
Frontiers in Optics Exhibit

Notes from the Developer

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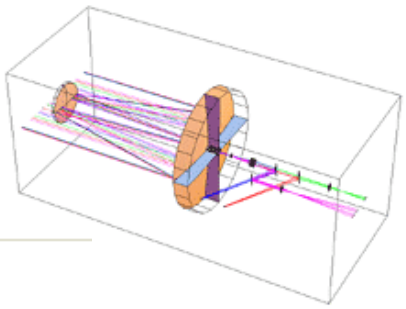

Modeling Ideal Lenses:

In *Rayica*™, *Wavica*™, and *LensLab*™, you can use the ThinLens and ThickLens functions to model the behaviors of ideal paraxial lens elements. This is helpful when you wish to model an optical design concept but have not settled the specifics of a lens assembly. In particular, ThinLens models the ray-trace behavior of an infinitely thin lens element, while ThickLens includes a finite principle plane spacing in the model.

Both ThinLens and ThickLens behave as ideal lens elements for paraxial ray traces by using the ABCD matrix representations for thin and thick lenses. If you use a single focal-length value, then the lens model behaves as a cylindrical element that focuses in only two dimensions. This is shown for the thin lens in figure 1. In *Rayica* and *Wavica* you can also specify a list of two focal lengths to model the full three-dimensional behavior of a radially-symmetric lens system. This is shown for the ThickLens in figure 2.

```
TurboPlot[{CircleOfRays[45,NumberOfRays->20],
    Move[ThinLens[100, 50],10],
    Boundary[125,GraphicDesign->Off]},Axes->True];
```

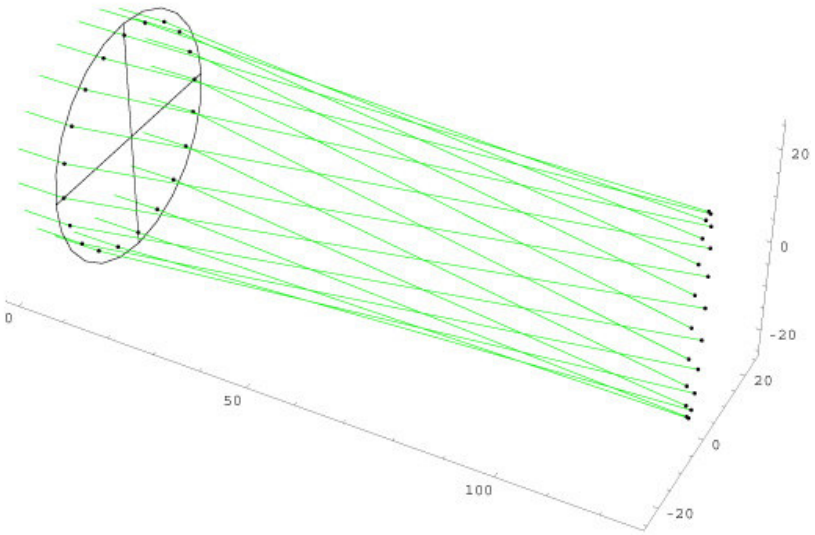

Figure 1

```
TurboPlot[{CircleOfRays[45,NumberOfRays->20],
    Move[ThickLens[{100,100}, 50,10],10],
    Boundary[125,GraphicDesign->Off]},Axes->True];
```

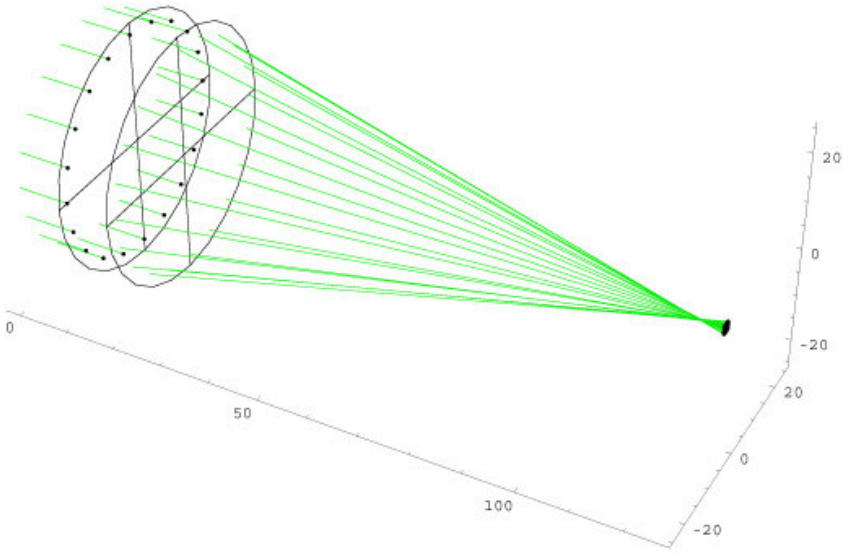

Figure 2

Air versus Vacuum:

Some of you may have noticed a small difference in the results calculated by *Rayica-Wavica* from your back-of-the-hand calculations. Here is an example:

```
TurboTrace[{SingleRay[], Move[Screen[100],1000]},OpticalLength]
```

{1000.27}

In this case, you might have expected the optical length to be 1000. This is because both Rayica and Wavica model the effects of the surrounding air in the optical system (IntrinsicMedium -> Air). You can instead switch to the vacuum model by using IntrinsicMedium -> Vacuum in your light source function. Here is an example:

```
TurboTrace[{SingleRay[IntrinsicMedium->Vacuum], Move[Screen[100],1000]},OpticalLength]
```

{1000.}

Our lead developer Donald Barnhart gives a presentation on the use of our software at Photonics West 2006.