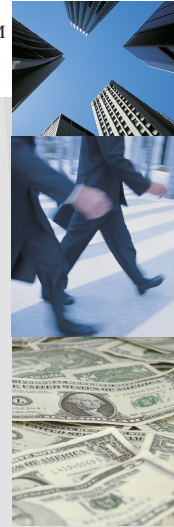
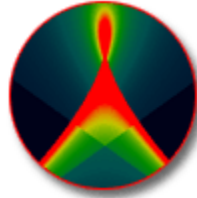


VOLUME
2

ISSUE
15

MAY-JUNE
2006

Optica Software



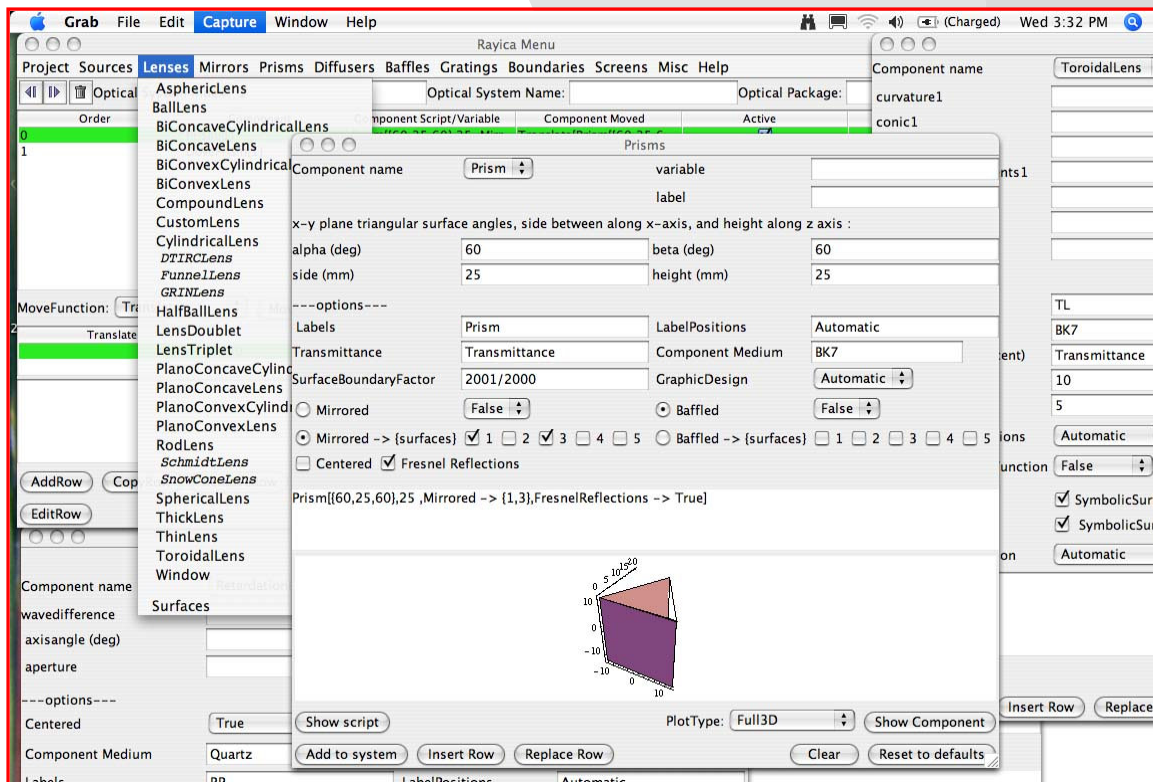
► OPTICA SOFTWARE
NEWS.....1

► Q&A MAILBOX/EVENT
SCHEDULE.....3

► NOTES FROM THE
DEVELOPER/USER TIPS...4

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

Optica Software News



GRAPHICAL USER INTERFACE – Developmental Alpha Version Released!

We recently released a new version of *Rayica*TM. Included in this release is the development alpha version of the graphical user interface, a preliminary version of **SliderWindow**, and other updates. To use the new GUI features, users will need either *Mathematica*[®] 5.2, or *Mathematica*[®] 5.0 with a download of GUIKit from www.wolfram.com installed. For more details about the GUI see: <http://www.opticasoftware.com/GUI/index.html>.

[CLEO 2006 Update](#)

Over 5,000 people attended CLEO 2006 this year making it one of the largest ever. We would like to thank the many customers and guests who visited us to catch a first glimpse at our new [graphical user interface and real-time slider system](#). See some of our photos from CLEO below.

Our online survey recipient for **May-June 2006** is **William Pfenninger**, from **UltraDots, Inc.**, who won the *Rayica-Wavica* Bundle with its newest features. Please continue to fill out the survey for your chance to win. For more details on how to participate please visit our [homepage](#).

2006 Order Form

For your convenience you may now submit your orders by fax or email [2006 Price List and Order Form](#).

ONLINE SALE

We are currently offering a **5% discount** on all plans ordered from our [website](#) through July 31, 2006.

USER TESTIMONIAL

"I look to *Rayica*[™] almost daily to answer both simple and difficult optical problems. I get close to an order of magnitude more mileage out of *Rayica* than my other more expensive ray-tracing programs. There is simply no substitute for the flexibility and power that *Rayica* and *Wavica*[™] offer. While you don't have to be a *Mathematica*[®] expert to use *Rayica*, I've found the ability to leverage *Mathematica*[®] for further analysis to be indispensable."

Mark Decker
Laser Systems
Northrop Grumman Corporation

Consultants Wanted:

We are seeking users of *Rayica* and *Wavica* who may be interested in helping support Optica Software with special projects on a consulting basis. If you are interested, please send a brief description of your experience and expertise to [software development](#).

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.

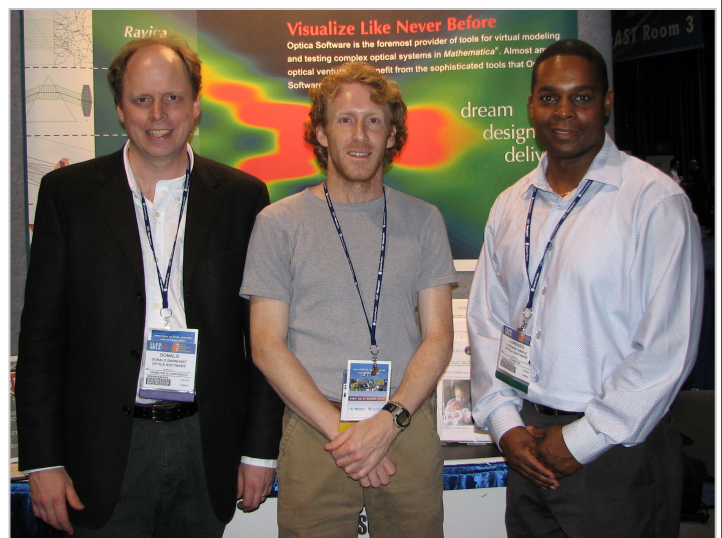
[Commercial](#)

[Government](#)

[Non-profit organizations](#)



Traian Dascalu from the National Institute for Laser, Plasma and Radiation Physics visits with Donald Barnhart and Lorenzo Kindle at CLEO 2006.



Donald Barnhart, Dr. John Moss, from the Oak Crest Institute of Science, with sales executive Lorenzo Kindle.



Q&A Mailbox

Q: Does Rayica™ use Mathematica® and is Rayica backward-compatible with the Wolfram version of Optica™?

A: Rayica is a direct descendent of Optica and uses Mathematica® in the same way. As such, Rayica contains all of Optica's functions and can run all Optica notebooks but Optica cannot run all of Rayica's notebooks since many Rayica functions do not exist in Optica. However, there have been some minor syntax changes between the default behavior of some functions in Rayica and Optica, but you can easily switch Rayica's syntax back to the original Optica format if you wish. These changes are well documented at the end of the new Rayica User Guide which you can [view](#) on our website.

Submit your questions to our [Optica Software Development Team](#)

Contact Us:

Donald Barnhart, Lead Developer
donald@opticasoftware.com

Lorenzo Kindle, Sales Executive
lorenzo@opticasoftware.com

Ann Williamson, Software Developer
annw@opticasoftware.com

Support
support@opticasoftware.com

Website
www.opticasoftware.com

Phone
217.328.9847
866.328.4298

Fax
217.328.9692

Gaussian beams in Rayica and Wavica:

In Rayica and Wavica, you can model the behavior of Gaussian beams with the GaussianBeam function. Typically, in order to define a particular GaussianBeam shape, you need to provide the spot radius and full-angle divergence of the beam: GaussianBeam[spotsize, divergence]. In such cases, the Gaussian beam is modeled with the specified spot radius and divergence created at its origin. Until recently, creating a Gaussian beam from its waist position has been significantly tricky to accomplish because, in general, the Gaussian beam will not be created with its waist at the origin unless you have been careful to choose the radius and divergence value that corresponds with the actual beam waist position. Instead, the actual beam waist will occur at some distance away from the modelled starting position. In order to make the task of modeling the Gaussian beam at its waist easier, we have added two new input patterns for GaussianBeam in the most recent build-date for Rayica (June 2006). These are GaussianBeam[waist spotsize, 0] and GaussianBeam[0, waist divergence]. In particular, when GaussianBeam[waist spotsize, 0] is used, the GaussianBeam function will internally calculate the correct divergence value to correspond with the given spot size. Otherwise, when GaussianBeam [0, waist divergence] is used, the GaussianBeam function will internally calculate the correct waist spot size value to correspond with the given divergence.

2006 Exhibit Event Schedule

Optics & Photonics

San Diego, CA

August 13-17, 2006

[Optics & Photonics Exhibit](#)

Frontiers in Optics

Rochester, NY

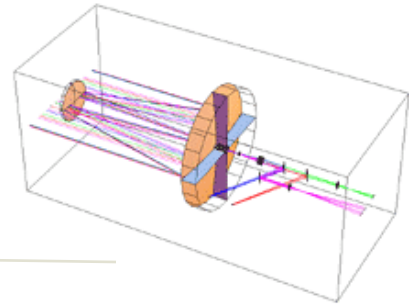
October 10-11, 2006

[Frontiers in Optics Exhibit](#)



Notes from the Developer

Donald Barnhart, Ph.D. – Optica Software Lead Developer
donald@opticasoftware.com



USER TIP

Symbolic Parameters in *Rayica*[™] and *Wavica*[™]

One of the things that most distinguishes *Rayica* and *Wavica* from other products, such as ZEMAX[®], is the use of symbolic parameters to define your optical models. In particular, when using *Rayica* and *Wavica*, you can assign your own symbols to identify parameters in your system, such as the curvature of a lens or the shape of mirror, and then iteratively change the numeric assignments of these symbolic parameters to perform parameter-dependent optimizations, tolerances, or visual animations of your system. In general, there are two different ways of working with symbolic parameters.

The first method is to create a user defined function for the optical system using the delayed assignment:

```
mysystem[linewidth_, numberofrays_, focallength_, screenposition_] := TurboPlot[
{LineOfRays[linewidth, NumberOfRays->numberofrays], PlanoConvexLens[focallength, 50, 10],
Move[Screen[50], screenposition]}]
```

In this case, the system gets created when you evaluate **mysystem** with numeric parameters:

```
mysystem[40, 7, 100, 200]
```

Iterative calculations will then require a new system model to be built with each new iteration:

```
Table[TurboPlot[mysystem[40, 7, f, 200]], {f, 50, 150, 25}]
```

The second approach is to use an ordered pair of symbols and numeric values for each parameter assignment in the system:

```
mysystem = TurboPlot[ {LineOfRays[40, NumberOfRays->7],
PlanoConvexLens[{focallength, 100}, 50, 10], Move[Screen[50], {screenposition, 200}]}]
```

In this case, the system model is created as soon as **mysystem** has been evaluated since each symbolic parameter has already been assigned a dual numeric value:

Here iterative calculations are now made using the SymbolicValues option:

```
Table[TurboPlot[mysystem, SymbolicValues->{focallength->f}], {f, 50, 150, 25}]
```

The advantage here is that iterative calculations can occur much more quickly since the system gets created only once.

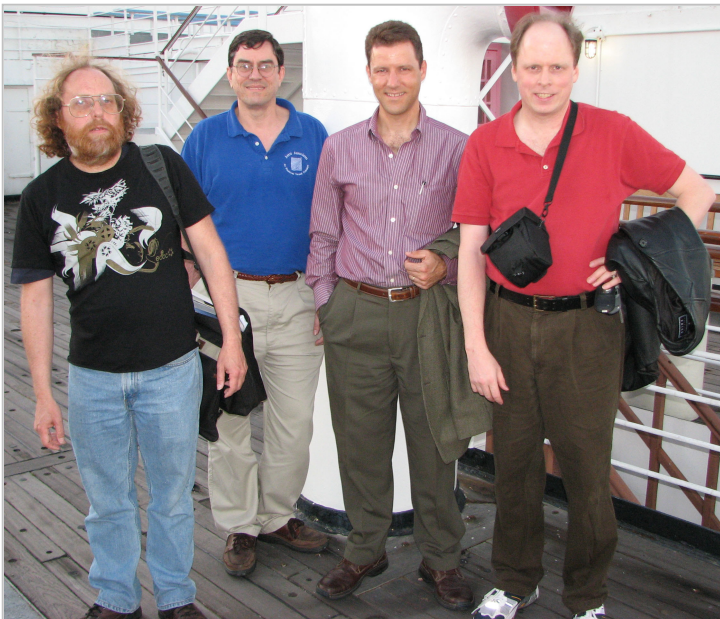
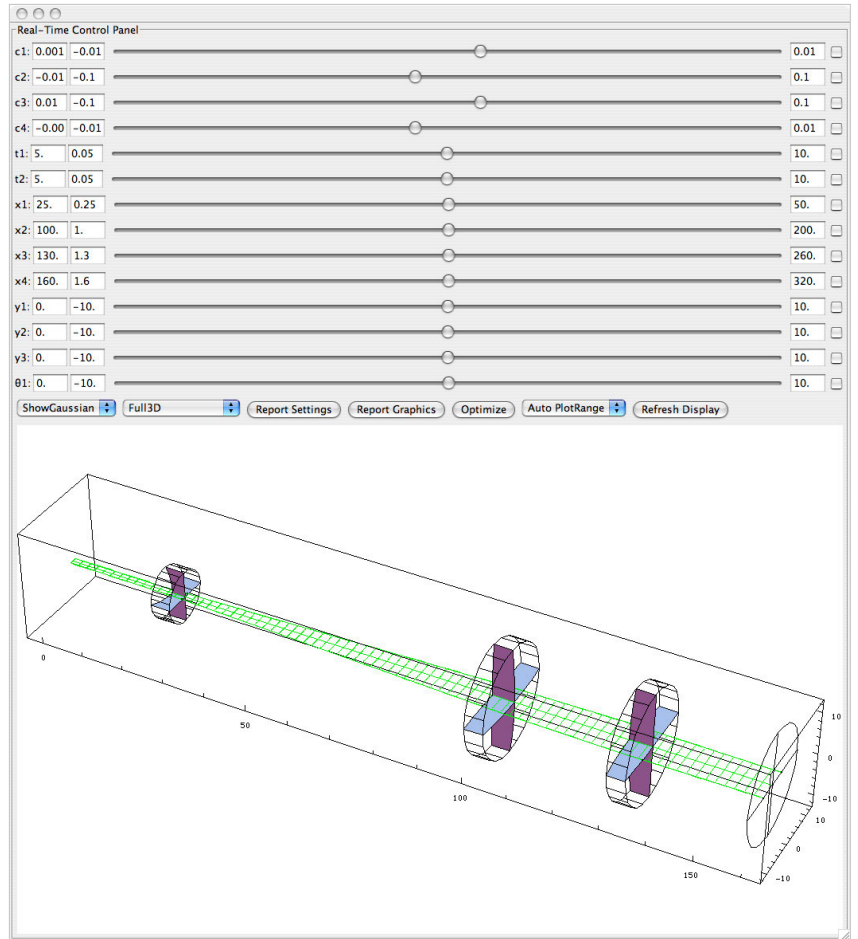
Real Time Sliders Are Here!

Using the GUIKit of *Mathematica*[®], we have discovered a way to display your optical system in real-time as a “SliderWindow”.

Here, each user-defined parameter becomes a slider bar that you can drag to change its value. The **SliderWindow** enables the user to quickly visualize how changes to different system parameters will affect the outcome of the optical model. This also opens the door to novice users that have no working knowledge of *Mathematica*[®] or our software to be able to quickly evaluate and explore a previously created **SliderWindow** model. We have released a preliminary version of **SliderWindow** in the new update. Please send comments to our software development team.

Rayica™, Wavica™, and LensLab™ now available in DEMO mode

We have now implemented password protection in our software which also enables us to offer **DEMO** versions of our software. [Contact us](#) for more information.



Scott Elofson, Dr. John Engel of Areté Associates, James Murray, of Areté Associates, and Donald Barnhart relax aboard the Queen Mary ship in Long Beach during CLEO 2006.

FREE UPGRADES

The bottom right section of our [homepage](#) shows the latest “**build date**” for our software. As of this publication we have released the **Developmental Alpha Version of our NEW Graphical User Interface**. If you currently subscribe to our technical Annual Support Plan (ASP) you are entitled to upgrade your software free of charge. Customers who have ordered our software within the past 90 days are also entitled to upgrade as part of the 90 day support plan package included with your software purchase. Order our technical Annual Support Plan today to receive these new upgrades.

[Order Annual Support Plan](#)

To unsubscribe from this newsletter [click here](#)