

# new developments

## PLATFORM SUPPORT

*Mathematica* for Mac OS X was one of the exciting new products featured during the opening keynote address at the January 2002 Macworld Conference and Expo held in San Francisco, California. This fully native version of *Mathematica* for Mac OS X offers users significant speed gains and vastly improved stability compared to running *Mathematica* on earlier Macintosh operating systems.

For more information: [www.wolfram.com/news/macexpo2002.html](http://www.wolfram.com/news/macexpo2002.html)

Microsoft Windows XP has been added to the list of supported platforms for *Mathematica* 4.1. Future versions of *Mathematica* will take full advantage of a variety of new Windows XP features, including themes and expanded internationalization support.

For more information: [www.wolfram.com/news/windowsxp.html](http://www.wolfram.com/news/windowsxp.html)

## RECENT BOOK RELEASES

*Mathematical Statistics with Mathematica* by Colin Rose and Murray D. Smith  
[store.wolfram.com/view/book/ISBN0387952349.str](http://store.wolfram.com/view/book/ISBN0387952349.str)

*Fundamentals of Kinematics and Dynamics of Machines and Mechanisms* by Oleg Vinogradov  
[store.wolfram.com/view/book/ISBN0849302579.str](http://store.wolfram.com/view/book/ISBN0849302579.str)

*Nonlinear Physics with Mathematica for Scientists and Engineers* by Richard H. Enns and George C. McGuire

[store.wolfram.com/view/book/ISBN0817642234.str](http://store.wolfram.com/view/book/ISBN0817642234.str)

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## ADDITIONAL MATHEMATICA APPLICATIONS

*VAR+* is a state-of-the-art software system for analysis of market risk based on Monte Carlo and historical simulations. *VAR+* analysis can also be extended to cover strategic planning and hedge accounting.

[www.wolfram.com/products/applications/var](http://www.wolfram.com/products/applications/var)

*MathModelica* is a powerful engineering tool for virtual model building and dynamic simulation of a large variety of physical systems. It handles all kinds of engineering domains such as mechanics (translational, rotational, 3D multibody), electronics, hydraulics, thermodynamics, and control systems. *MathModelica* can be used to support updated and correct decision-making in all stages of a product's life cycle—from early conceptual design and prototype considerations to improvements and problem solving of already existing product designs.

[www.wolfram.com/products/applications/mathmodelica](http://www.wolfram.com/products/applications/mathmodelica)

*Mathematica for ActiveX* is a toolkit allowing Windows developers to easily integrate *Mathematica* with Visual Basic programs and Visual Basic for Applications host applications such as Microsoft Excel. Other ActiveX or COM-based languages, including Visual Basic Script, can also be integrated.

[www.wolfram.com/products/applications/max](http://www.wolfram.com/products/applications/max)

To have the latest news and updates from Wolfram Research delivered direct to your inbox, subscribe to *MATHwire*, our email newsletter, at: [www.wolfram.com/mathwire](http://www.wolfram.com/mathwire)

# TECHNICAL SOFTWARE NEWS

A WOLFRAM RESEARCH BULLETIN

ISSUE ONE 2002

COMING IN MAY 2002

## STEPHEN WOLFRAM A NEW KIND OF SCIENCE

Following nearly 20 years of work by *Mathematica*® creator and Wolfram Research CEO Stephen Wolfram, May 2002 will see the publication of Wolfram's long-anticipated book *A NEW KIND OF SCIENCE*.

Surprising results from a series of innovative computer experiments done by Wolfram in the early 1980s inspired him to begin developing a radically new approach to fundamental problems in science. The need for better tools to address such a broad spectrum of issues in many fields—and to support novel approaches—was a large part of what led Wolfram in the mid-1980s to begin the creation of *Mathematica*, and to use his insights in science to develop the language concepts of *Mathematica*.

For centuries science has emphasized models based on traditional mathematical equations. Wolfram's key idea is to use the more general kinds of rules that can be embodied for example in *Mathematica* programs. And one of his dramatic discoveries has been that even simple such rules can lead to immensely complex behavior, which seems to capture the essence of many processes in nature that have long seemed mysterious.

Written to be accessible to a wide audience, Wolfram's book presents his discoveries for the first time, and shows how his new conceptual framework addresses long-standing foundational problems in physics, biology, mathematics, computer science, and other areas. Detailed notes in the book include Wolfram's *Mathematica* programs for implementing the ideas in the book, which provide powerful illustrations of the *Mathematica* language at work.

*A NEW KIND OF SCIENCE* will be published worldwide in May 2002, and will be available from all major booksellers.

For more information:  
[www.wolframscience.com](http://www.wolframscience.com)

## CALCULATIONCENTER® 2 ADDS NEW CALCULATION AND COMMUNICATION CAPABILITIES



*CalculationCenter* 2 from Wolfram Research, Inc. brings you new computing functionality, new communication capabilities, and further enhancements to this widely acclaimed calculation tool—all without compromising quality.

Initially released in March 2001, *CalculationCenter* has been highly rated by *MacWorld*, *Desktop Engineering*, and *PC Plus*, among others, and was well received by users. *CalculationCenter* 2 builds upon its innovative point-and-click interface concept, smart plotting, and unique InstantCalculators™ to provide a host of new features:

- Broad new statistics capabilities allow you to develop models that describe random behavior and give you a greater range of problem-solving ability.
- An extended range of graphic types includes a new multiple-data-set plot type for easier data comparison and a new inequality plot that can visualize complicated inequality relationships.
- Enhanced intelligent error-correction technology means there are now more cases where *CalculationCenter* can save you time by suggesting what you meant to type.
- Users switching to *CalculationCenter* from Excel or other systems can type or paste in a formula containing functions from those programs and *CalculationCenter* will suggest the equivalent or closest function available.
- New support for MathML 2.0, the latest open standard for math-on-the-web, allows you to better share your work over the web.
- Support for 3D file formats DXF and STL, and the data format CSV, facilitates interaction with other engineering, design, and data handling software.
- New, faster, algorithms for many of *CalculationCenter*'s data analysis functions means that now you can analyze and manipulate large data sets faster than ever before.

Containing hundreds of functions—most working with symbolic as well as numeric input and all with InstantCalculator support—*CalculationCenter* is the only tool needed to easily produce superior-quality technical reports that can be distributed by hard copy, via email, or on the web. Also ideal for organizations, *CalculationCenter* enables users of varying needs to share compatible documents and maintain the notebook document presentation style consistent with other Wolfram Research products.

*CalculationCenter* 2 is available for Windows 95/98/Me/NT/2000/XP and Mac OS platforms.

For more information: [www.wolfram.com/calculationcenter](http://www.wolfram.com/calculationcenter)



# webMATHMATICA®

## The Way the Web Calculates

### Examples of how webMathematica is being used

#### Addison-Wesley Introduces MathXL and webMathematica Collaboration

Addison-Wesley, one of the world's most respected publishers of mathematics, statistics, computer science, economics, and finance textbooks, will soon launch new online calculus tutorials and testing using webMathematica technology from Wolfram Research. The web-based program is designed to help diagnose students' calculus skills and to create a personalized study plan based on their test results.

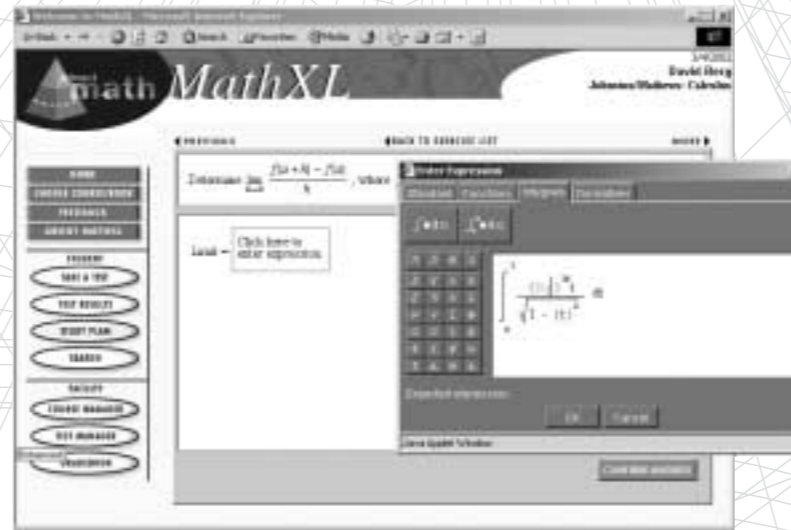
webMathematica provides the long sought-after ability to quickly and easily add interactive calculations to the web, and was intended for the development and deployment of sophisticated intranet and internet sites like MathXL for Calculus. To develop MathXL for Calculus, Addison-Wesley needed the display and evaluation capabilities of a symbolic online computing system, and webMathematica was the only tool that met these needs.

With MathXL for Calculus, students can get unlimited practice from algorithmically generated tutorial exercises correlated to each chapter and section of their Addison-Wesley textbook. Instructors can create customized tests and quizzes, and view all student test results, study plans, and tutorial work in the online grade book. Because every piece of MathXL for Calculus is delivered over the internet, it is also ideal for online or distance learning courses.

webMathematica is fully compatible with state-of-the-art dynamic web systems, which made it easy for Addison-Wesley to integrate webMathematica into their existing web foundations. Online and distance education was always envisioned as a perfect fit for the possibilities of webMathematica, and Addison-Wesley is leading the way in utilizing this unique technology for this purpose.

Preview MathXL for Calculus using the login name/password combination: previewmathxl/adopt. Select "Johnson/Mathews: Calculus" from the "Choose Course/Book" scrolling menu.

For more information: [www.mathxl.com](http://www.mathxl.com)



#### HostSRV.com

HostSRV.com, a new service that specializes in hosting webMathematica applications, is offering a discount to Premier Service customers who "park" their webMathematica license with HostSRV.com. For a limited time, new accounts are also eligible to receive several hours of free consultation.

For more information: [www.HostSRV.com](http://www.HostSRV.com)

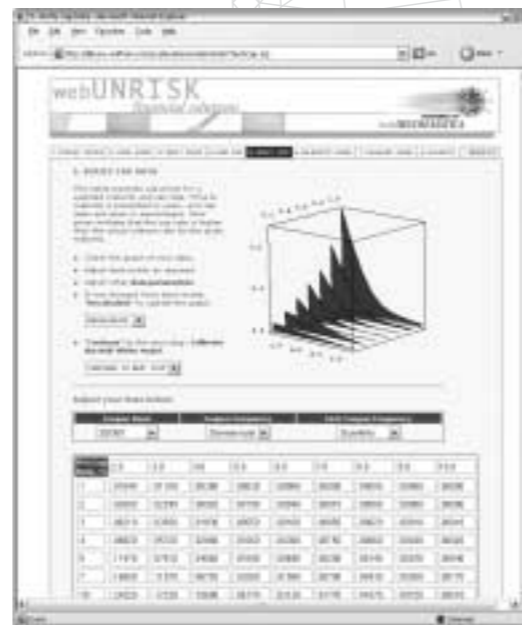
#### webUnRisk: Analyze Financial Derivatives with UnRisk and webMathematica

webUnRisk, an interactive new risk analysis tool on the Wolfram Research website, is just one example of the types of financial analysis you can perform when you combine a top-notch derivatives pricing engine like UnRisk with the online technical computing power of webMathematica.

webUnRisk shows the valuation of constant-maturity floaters under a generalized Hull-White stochastic interest rate model. Either by using the sample data on the site or by uploading their own, users can determine swap rates and cap prices for various maturities and cap rates. The swap and cap data can then be used to calibrate the Hull-White model and to demonstrate how well this model fits actual market prices for caps. Finally, webUnRisk allows users to value a constant maturity floater under the Hull-White model and to perform a sensitivity analysis for the instrument.

With UnRisk 1.5 and webMathematica, you can deploy interactive, complex financial calculations via a standard, easy-to-use web interface. Based on the world's leading technical computing software and the proven Java Servlet technology, webMathematica-based systems are easily customized to fit into a financial institution's existing infrastructure. Furthermore, such applications can easily be updated as new analysis techniques become available.

Visit the webUnRisk website: [library.wolfram.com/explorations/webunrisk](http://library.wolfram.com/explorations/webunrisk)



#### UnRisk 1.5

webUnRisk highlights some of the new features present in UnRisk 1.5, the latest release of this Mathematica application package which now covers extended interest rate models and adds an intuitive, form-based, point-and-click front end to its list of features. With this new interface option in addition to existing Excel workbook and Mathematica notebook formats, financial traders, treasurers, risk managers, quantitative analysts, and risk controllers can now collaborate on single-source models from within their own task-oriented front ends.

UnRisk covers a wide variety of equity and interest rate derivatives and requires Mathematica 4 or later.

For more information: [www.wolfram.com/products/applications/unrisk](http://www.wolfram.com/products/applications/unrisk)

## MATHEMATICA TECHtips...

MathLink® provides a general interface for external programs to communicate with Mathematica. It is a library of functions that implement a protocol for sending and receiving Mathematica expressions. Many standard software systems now have MathLink compatibility either built in or available in add-on modules. A MathLink tutorial and additional reference information are available.

[library.wolfram.com/tips/mathlink.html](http://library.wolfram.com/tips/mathlink.html)

### Features that can help you make the most of your Mathematica experience...

You can perform multivariate linear regression with the Mathematica function `Regress`. This and other related functions can be found in the standard add-on package Statistics. An example of basic ordinary least squares (OLS) regression on a data set with three independent variables is shown here.

[library.wolfram.com/howtos/regress](http://library.wolfram.com/howtos/regress)

You can build or connect customized interface environments to Mathematica with differing capabilities and optimizations. Which environment you choose depends on your application, existing infrastructure, and users.

[www.wolfram.com/solutions/mathlink/interfaces.html](http://www.wolfram.com/solutions/mathlink/interfaces.html)

You can use `J/Link` to call operating system services from Mathematica and to add your own graphical user interface elements.

[library.wolfram.com/examples/FileChooserDialog](http://library.wolfram.com/examples/FileChooserDialog)