

# technical software news

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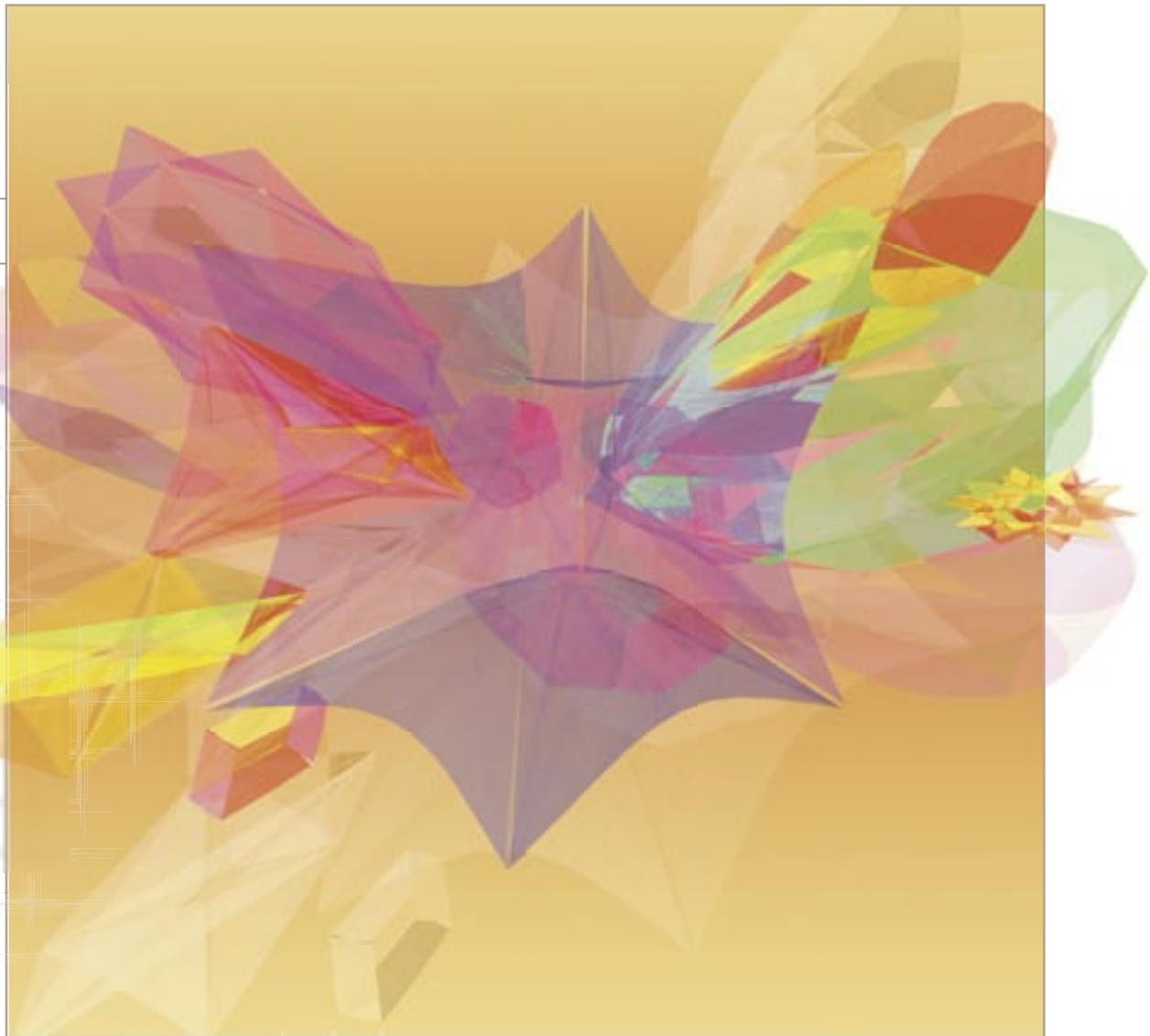
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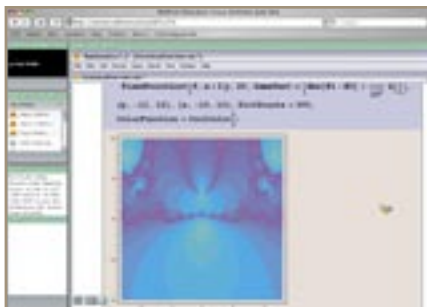
# New from Wolfram Education Group



## Free online seminars provide overview of *Mathematica* technologies

Wolfram Education Group now offers free, live, online seminars to all interested customers worldwide. Presented by senior Wolfram Research staff, these seminars provide an excellent, informal way to learn more about *Mathematica* and its use. They are designed for people who are new to *Mathematica*, those who haven't kept up to date with the latest versions of *Mathematica*, or simply those who are thinking about taking an online Wolfram Education Group course and want to get an idea of how they are run.

The first seminar being offered, "S10: A Technical Overview of *Mathematica*," provides an introduction to *Mathematica's* major technologies and the capabilities that they enable. Covering topics such as numeric and symbolic computations, programming, working with data, visualization, technical documents, and connection technologies, the seminar lasts approximately one hour, allowing for a 45-minute presentation



**The S10 Seminar "Meeting Room"**

The S10 seminar is delivered live over the internet using Macromedia Breeze™. *Mathematica* notebooks and other materials are used to give an overview of the software's capabilities.

and 10–15 minutes for questions. It is offered twice a week and participants are given comprehensive presentation materials, including sample "jump-start" computational tasks with solutions provided.

"We expect that these seminars will better educate potential users about *Mathematica* and how it can serve their needs," said Paul Wellin, manager of Wolfram Education Group. "Oftentimes people have questions that are best answered by demonstration, or that are more easily understood when one possesses a preliminary knowledge of the system. This format is ideal for those who would like to increase their familiarity with the system and its latest features."

**"There was a lot...packed in 1 hour, but it was an excellent overview of *Mathematica's* capabilities. I can go back to the seminar notebook and learn more about specific functions that I am interested in."**

**~An S10 seminar attendee**

The online seminars are a new initiative for Wolfram Education Group, which was established five years ago to meet the training needs of the *Mathematica* community. As the division has continued to grow and diversify its course delivery

methods, adding a preview component was a natural progression. "People who have taken our courses consistently tell us that the experience has a tremendously positive impact on their understanding of *Mathematica* and their ability to use it in their work," added Wellin. "In educating our broader customer base, we want to make all users better able to take advantage of *Mathematica's* capabilities from day one."

Wolfram Education Group online seminars are free to the public and accessible to anyone with an internet-enabled computer and web browser with Flash Player installed. A telephone with a speaker or telephone headset, or a suitable computer microphone or headset, is also required. The seminars will be repeated weekly on Wednesdays at 10am U.S. Eastern Time (-5:00 GMT) and Thursdays at 4pm U.S. Pacific Time (-8:00 GMT). Additional topics are being considered for future seminar offerings.

For more information or to register for an online seminar, visit: [wolfram.com/r/7016/wegs10](http://wolfram.com/r/7016/wegs10)

## Worldwide Training Opportunities



Wolfram Education Group (WEG™) began with a single on-site "Introduction to *Mathematica*" course and has quickly expanded to include a wide range of center-based and online classes in almost every country where *Mathematica* is used.

In other words, no matter where you are, there is now an accommodating course open for registration. Expert WEG

instructors are based around the world, offering training in English, Arabic, French, Japanese, and many other languages.

With such a diverse staff, WEG can also customize its courses for virtually any organization. Based on standard seminars, these special sessions are ideal for large group environments.

For more information and a complete training schedule, visit: [wolfram.com/r/7016/weg](http://wolfram.com/r/7016/weg)

## Certified *Mathematica* Training

Find the course that's right for you

Wolfram Education Group courses are designed to provide the highest-quality training in all areas of *Mathematica*. Beginning, intermediate, and advanced classes all incorporate numerous real-world examples and practical, hands-on exercises. Sample course offerings include:

### One- and Two-Day Courses

#### **M100: Introduction to *Mathematica***

Provides direct experience with the basic *Mathematica* features needed to become a proficient user.

#### **M101: A First Course in *Mathematica***

Gain direct experience with all the basic features of *Mathematica* and a comprehensive foundation for developing advanced applications of the system.

#### **M102: Project Session**

Scheduled with the M101 course, this one-day session explores selected topics further and lets participants develop uses of *Mathematica* in their own areas of interest and application.

#### **M110: Working with Data Using *Mathematica***

Gain hands-on experience in the basic mechanics of importing, exporting, manipulating, analyzing, and visualizing data in *Mathematica*.

#### **M220: Programming in *Mathematica***

A focus on the programming capabilities of *Mathematica*. Demonstrates how to choose the appropriate programming paradigm for solving problems as well as how to develop applications.

#### **M245: Parallel Computation**

Addresses the use of *Parallel Computing Toolkit* for developing parallel programs in *Mathematica*, including installation issues on networks and *gridMathematica*<sup>™</sup>, basic parallel programming methods, concurrency, and performance tuning.

#### **M310: Digital Image Processing**

The theory and practice of digital image processing with *Mathematica*. Focuses on the *Digital Image Processing* package, demonstrating its features and capabilities.

#### **M330: Neural Networks**

The theory and practice of neural networks with *Mathematica* and the *Neural Networks* package. Explains relevant theory and practical issues for using neural networks to find relations in data, and illustrates problems and possibilities of these methods.

### Exclusive offer

Save 15% on any WEG course now through December 31, 2006! Enter promo code PD1614 to receive your discount.  
[wolfram.com/r/7016/wegcalendar](http://wolfram.com/r/7016/wegcalendar)

### Online Mini-Courses

#### **M185: Numerical Computation in *Mathematica***

An overview of the numerical capabilities of *Mathematica*, from numbers and basic arithmetic to solving partial differential equations. Builds understanding of working with *Mathematica*'s numerical capabilities.

#### **M195: Authoring in *Mathematica***

An introduction to using the tools in *Mathematica* for creating, managing, and publishing technical documents.

#### **M215A/B: Applied Statistical Analysis with *Mathematica***

This mini-course series focuses on the statistical analysis of data in *Mathematica*. Covers import and extraction, distributions, hypothesis testing, ANOVA, linear and nonlinear fitting, regression diagnostics, and visualization. Also available as a one-day course.

#### **M345: Grid Computing with *Mathematica***

Demonstrates parallel programming constructs and discusses the underlying technology of *gridMathematica*, the computer and network architectures supported by *gridMathematica*, and optimization strategies.

#### **M355: A First Course in web*Mathematica*<sup>™</sup>**

Special attention to web*Mathematica* installation issues, authoring web*Mathematica* pages, and techniques for converting existing *Mathematica* notebooks into web*Mathematica* pages.

#### **M455: An Introduction to Web Services with *Mathematica***

Demonstrates how to make your *Mathematica* session more dynamic and powerful using web services to import data and functionality on the fly.

For a full listing of Wolfram Education Group courses and additional class details, visit:

[wolfram.com/r/7016/courses](http://wolfram.com/r/7016/courses)

## inside wolfram research



with Paul Wellin,  
Manager of Wolfram  
Education Group

We established Wolfram Education Group five years ago to address a need in the *Mathematica* community for affordable, high-quality *Mathematica* training.

From interactions with our users, we know that there are three main groups for whom training is important: people new to *Mathematica*; those familiar with it, who want to deepen their understanding; and those looking for information on particular applications like image processing, neural networks, or grid computing.

When addressing any of these groups, our primary goal has been to make sure that training is as easily accessible as possible no matter where they are in the world. That's why, over the past several years, we've broadened our coverage to include most of Northern and Western Europe, Australia, Japan, New Zealand, Jordan, Lebanon, Turkey, Singapore, and Oman. We'll also be expanding soon to Mexico, Korea, and Egypt.

We were set up from the beginning to adapt quickly to our rapidly growing base of *Mathematica* users. About two to three years ago, for example, we noticed that many of our corporate and government customers were tightening their budgets and couldn't travel to center-based classes anymore. We responded by launching new online offerings that have since taken off with other users as well.

We then took the curriculum one step further, developing tightly focused online "mini-courses" on specialized topics and emerging technologies like grid computing and web services. The mini-courses have been tremendously popular and are the best way to get an inside scoop on our latest technologies. In fact, we always keep several new mini-courses in the pipeline, so we can offer training as soon as new versions of our software are available.

Finally, we've now launched a new series of free, live seminars that you can learn more about on the opposite page. We're excited to offer them to all of our users, and I hope you'll sign up for one soon.

As with all of our courses, the free seminars are also fully integrated into *Mathematica*. No matter what your background, you'll benefit from learning in the same environment that you'll eventually be working in.

I invite you to take a look at all our offerings and read the profiles of our expert instructors at:

[wolfram.com/r/7016/weg](http://wolfram.com/r/7016/weg).

Please contact me if you have any comments, questions, or course ideas. Email me at [education@wolfram.com](mailto:education@wolfram.com).

*Paul Wellin joined Wolfram Research in 1993 and is co-author of the popular book, Introduction to Programming with Mathematica, now in its third edition.*

# Introducing Wolfram Workbench

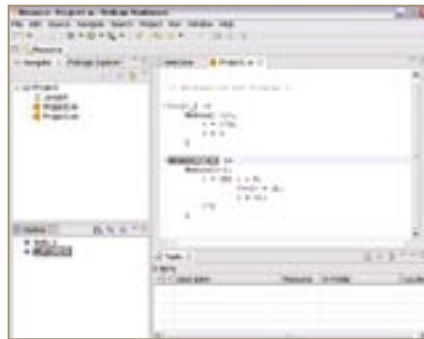
The state-of-the-art development environment for custom solutions

Wolfram *Workbench* is the state-of-the-art integrated development environment (IDE) that incorporates *Mathematica* technologies. Complementing *Mathematica*'s uniquely powerful, high-level programming language and world-renowned features for computation, visualization, and modeling, *Workbench* is ideal for development of large-scale technical solutions.

"*Workbench* has unlocked *Mathematica*'s potential as the way to build technical software," said Tom Wickham-Jones, director of kernel technology and lead *Workbench* developer. "If you're working on technical application development, we've built the definitive system." Together, *Workbench* and *Mathematica* enable the creation of innovative technical applications in areas such as engineering, science, finance, and education.

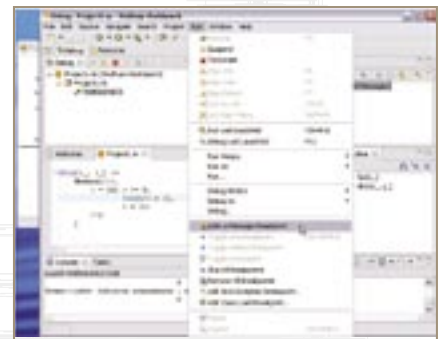
Built on Eclipse, a leading platform for IDE development, *Workbench* makes it easy for Eclipse adopters to use *Mathematica* for their applications. Existing *Mathematica*-based developers gain access to state-of-the-art development tools, resulting in more efficient project construction and increased productivity.

"*Mathematica* is the only system capable of spanning the development spectrum, from small to large projects," said Conrad Wolfram, director of strategic marketing at Wolfram Research.



#### Source Code Editor

The source code editor enables syntax highlighting, variable coloring, usage information and comments, package conversion, and much more.



#### Debugging

A key feature of *Workbench*, the debugger allows you to study your code as it runs so that you can detect and fix any problems.

#### Key *Workbench* features enable users to:

- Group files, code, and other *Mathematica* resources into a single project
- Perform source code editing with syntax highlighting, error reporting, local variable coloring, and many more options
- Study code as it runs, and easily detect and fix any problems
- Profile the code's execution and develop and run tests
- Manage multiple versions of files and access version histories
- Build and deploy *Mathematica* packages

#### Features that make *Mathematica* ideal for development include:

- Multi-paradigm programming lets users program as they think, not as the language dictates
- Short, readable code means faster, simpler implementation
- World's most extensive computation library has symbolic as well as numerical and graphical functionality
- Built-in connectivity to other languages and extensions
- Cutting-edge deployment options

## Only in *Mathematica*



#### The Wolfram Technology Guide

Learn more about the unique features that make *Mathematica* the tool of choice for leaders in science and technology.

You may sometimes hear that another piece of software "has that feature" when discussing *Mathematica* functionality, but "feature list" comparisons often miss issues of software design quality and hidden sophistication below the surface.

This column highlights some of the differences in *Mathematica* that make it more powerful, simpler to use, and ultimately the better tool. In this issue, learn more about a fundamental design element in *Mathematica*: task-oriented superfunctions.

#### Task-Oriented Superfunctions


*Mathematica*'s task-oriented superfunctions (TOSF) each subsume the functionality of a large number of algorithm-based functions in non-*Mathematica* systems.

Unlike all other computation systems, *Mathematica*'s functions are "task-oriented"—named by which task they perform, not which algorithm(s) they use to perform them.

This distinction particularly affects high-level, multistage, multi-algorithm tasks, handled by "superfunctions" in *Mathematica*. Take numerical differential equation solving

## Free to Mathematica Premier Service Subscribers!

Complimentary access to Wolfram *Workbench* is the newest benefit of *Mathematica Premier Service*. Single-license subscribers can now download a free copy of *Workbench* prerelease from [wolfram.com/workbenchdownload](http://wolfram.com/workbenchdownload).



CellID	Type	Instructions
1	3.403	StreamlinedConnectivity[...]
2	3.405	Module[{param = 0, ...}, ...]
3	3.370	Module[{param = 0, ...}, ...]
4	3.403	Module[{param = 0, ...}, ...]
5	3.403	Module[{param = 0, ...}, ...]
6	3.474	Module[...]
7	3.374	Module[...]
8	3.374	Module[...]
9	3.411	Module[...]
10	3.411	Module[...]

### Profiling

The profiler creates a report on a function's execution, which can identify code in need of better optimization or any unexpected behaviors.

"*Workbench* boosts *Mathematica's* capability for more complex projects, taking technical development into the twenty-first century, away from Fortran and its cumbersome, matrix-based derivatives," added Wolfram.

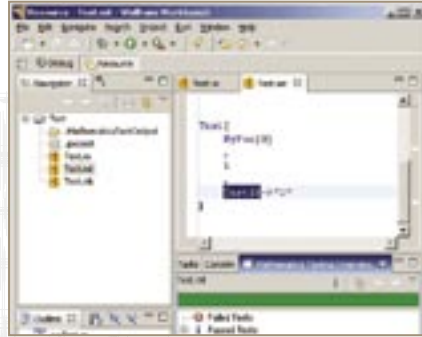
*"Workbench has quickly become an indispensable tool we wouldn't want to live without."*

~Sascha Kratky, *uni software plus*

"We can now develop both *Mathematica* and Java code in the same IDE and profit from the version control and build-management infrastructure we have already established around Eclipse," said Sascha Kratky of *uni*

as an example. In *Mathematica*, **NDSolve** is all you need to use. Applying this TOSF analyzes your equation and decides (unless you set an override) which of its dozens of algorithms and controller methods to deploy to get you an accurate answer quickly—sometimes switching mid-calculation for further optimization.

By contrast, non-*Mathematica* computation systems make you analyze your equation manually to determine which function to apply—e.g., where in *Mathematica* you use **NDSolve**, in *Matlab* you must choose among `ode45`, `ode23`, `ode113`, `ode15s`,



### Testing

The tester produces a report that details which tests have passed, lists any that failed, and gives links from the report to the actual tests in the test file.

software plus, a developer of custom software solutions in finance, engineering, and manufacturing."

Said Wolfram, "*Mathematica* has moved way beyond computer algebra and into sophisticated software development."

Initially available exclusively as a benefit of *Mathematica Premier Service*, *Workbench* is designed for use on Windows, Mac OS X, and Linux platforms. If you're not already a *Premier Service* subscriber, consider signing up today to receive this and many other great benefits!

For more information about *Workbench*: [wolfram.com/r/7016/workbench](http://wolfram.com/r/7016/workbench)

`bvp4c`, `pdepe`, and so on. Get the selection wrong and your computation could run inefficiently, fail altogether, or, worse still, produce an inaccurate answer. And there's no switching mid-calculation.

Another crucial benefit of the TOSF approach is future-proofing: algorithmic innovations enable TOSF to perform better without the form of the input or output being affected. Compatibility is therefore maintained while having the latest computational technology under the skin.

[wolfram.com/r/7016/tosf](http://wolfram.com/r/7016/tosf)

## Mathematica bytes

### Wolfram Research Called Upon for Its Experience with "Numb3rs"

Wolfram Research developers have acted as consultants for the popular CBS TV series, "Numb3rs." Having just ended its second season, the show's writers regularly turn to experts to authenticate the math used in the show.

Ed Pegg, Michael Trott, and Eric Weisstein of Wolfram Research are among those who contribute ideas and review early drafts. Look for Wolfram Research in the credits this fall.

[wolfram.com/r/7016/numb3rs](http://wolfram.com/r/7016/numb3rs)

### Mathematica Personal Grid Edition Named Editor's Choice

*Mathematica Personal Grid Edition* received the April 2006 Editor's Choice Award from *Scientific Computing* magazine.

[wolfram.com/r/7016/mpge](http://wolfram.com/r/7016/mpge)

### Mathematica CalcCenter™ 3 Offers Plenty to Users with Modest Needs

*Desktop Engineering* says the easy-to-use *CalcCenter 3* "is a pleasant development for those of us with modest calculational needs."

"...Included in the product are small subsets of *Mathematica's* vast subsets of functions, operations, and graphics that will remain plenty for many users."

[wolfram.com/r/7016/calcenter3](http://wolfram.com/r/7016/calcenter3)

### PathwayLab for Mathematica Has Role to Play in Future Biotech Advances

*Scientific Computing World* discusses the role of modeling tools such as *PathwayLab* for *Mathematica* in new advances in biology and medicine.

By facilitating system-level modeling of disease, *PathwayLab* can lead to counter-intuitive insights into how a system operates and thus to new clinical strategies and greater understanding of complex evolvable systems.

[wolfram.com/r/7016/pathway](http://wolfram.com/r/7016/pathway)

### Mathematica Ranks High as a Complete Statistical Package

According to a review in *The American Statistician*, *Mathematica* is a full-fledged statistical solution environment and a very useful tool for professional statisticians.

"Those with a good undergraduate background can use *Mathematica* to perform nearly every statistical task they need for their research. Those having a more extensive mathematical background can use *Mathematica* to push the very limits of statistical theory and application."

[wolfram.com/r/7016/amstat](http://wolfram.com/r/7016/amstat)

### Experience Exchange

Submit your nonproprietary journal or conference articles, papers, web links, or other *Mathematica* success stories to [experience@wolfram.com](mailto:experience@wolfram.com). If we feature your work on our website, we'll send you a *Mathematica* T-shirt.

[wolfram.com/r/7016/experience](http://wolfram.com/r/7016/experience)

## Programming Styles in Mathematica

Nearly all nontrivial programs use a mixture of programming styles. You should choose the programming style that seems most natural for what you want to do. One way to learn how to make that decision is to compare different styles of programming.

First we will solve a small problem using three different styles—procedural, functional, and rule-based: given a list of pairs of numbers, return a list consisting of the sum of each pair.

Here is a list of pairs of numbers that we will work with.

```
In[1]:=
pairs = {{58, 96}, {85, 22}, {100, 69},
         {5, 37}, {32, 64}, {41, 86}, {14, 0}, {79, 22},
         {55, 36}, {86, 39}, {38, 1}, {11, 15}};
```

The procedural approach is quite similar to working in a language like C or Fortran; allocate an (empty or null) array `result` of the same size as `pairs`, then replace each element in `result` by the sum of the first and second elements in each pair. Finally, return the value in `result`.

```
In[2]:=
result = Table[Null, {Length[pairs]}];
Do[result[[k]] = pairs[[k, 1]] + pairs[[k, 2]],
  {k, 1, Length[pairs]}]
result
```

```
Out[2]=
{154, 107, 169, 42, 96, 127, 14, 101, 91, 125, 39, 26}
```

Here is a structured procedure using `Table`.

```
In[3]:=
Table[pairs[[k, 1]] + pairs[[k, 2]], {k, Length[pairs]}]
```

```
Out[3]=
{154, 107, 169, 42, 96, 127, 14, 101, 91, 125, 39, 26}
```

The functional approach rests on a recognition that we need to convert each pair of the form `List[a,b]` to one of `Plus[a,b]`. Since we only need to replace the head of the list, `Apply` is the appropriate function here. In this case, we have to use `Apply` one level down from the default.

```
In[4]:=
Apply[Plus, pairs, {1}]
```

```
Out[4]=
{154, 107, 169, 42, 96, 127, 14, 101, 91, 125, 39, 26}
```

This can be accomplished more compactly by simply mapping the `Total` function across `pairs`.

```
In[5]:=
Map[Total, pairs]
```

```
Out[5]=
{154, 107, 169, 42, 96, 127, 14, 101, 91, 125, 39, 26}
```

The rule-based approach is quite compact. The pattern to match is any list consisting of a pair of expressions, and it will be replaced by the sum of that pair.

```
In[6]:=
pairs /. {p_, q_} -> p + q
```

```
Out[6]=
{154, 107, 169, 42, 96, 127, 14, 101, 91, 125, 39, 26}
```

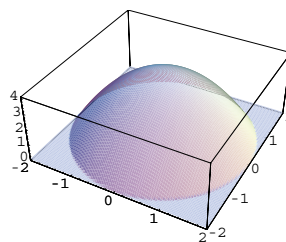
## Plotting Surfaces in Mathematica

A common task in visualizing functions of more than one variable is to plot surfaces bounded by a region in space or to plot and compare multiple surfaces in one graphic.

One way to plot a surface restricted to a certain region is to use Boolean functions. `Boole[expr]` returns 1 whenever `expr` is `True` and returns 0 when `expr` is `False`.

For example, this plots the paraboloid  $4 - (x^2 + y^2)$  that is bounded by the cylinder  $x^2 + y^2 < 4$ .

```
In[1]:=
Plot3D[(4 - (x^2 + y^2)) Boole[x^2 + y^2 < 4],
  {x, -2, 2}, {y, -2, 2},
  PlotPoints -> 100, Mesh -> False];
```



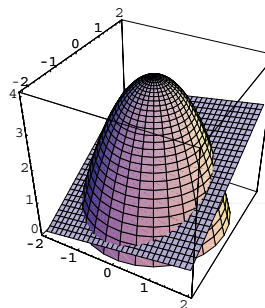
As an aside, you can use `Boole` in the same way to integrate a function over a region. For example, here we integrate  $x^2$  over the region defined by the unit disk.

```
In[2]:=
Integrate[x^2 Boole[x^2 + y^2 < 1], {x, -1, 1}, {y, -1, 1}]
```

```
Out[2]=
π
—
4
```

Here we use cylindrical coordinates for the parabolic cone and rectangular coordinates for the plane.

```
In[3]:=
ParametricPlot3D[{{
  {r Cos[t], r Sin[t], 4 - r^2},
  {2 r - 2, 2 t / π - 2, r + t / 3}},
  {r, 0, 2}, {t, 0, 2 π}];
```



### Want more tips from Wolfram Education Group?

These examples were derived from sample Wolfram Education Group course materials. Take advantage of our exclusive offer on page 3 to get hands-on Mathematica instruction with certified training.

## corporate **developments**

### New China Programs Support Growing *Mathematica* Use

The first-ever Wolfram Research Tour of China featured key kernel developer Dr. Yifan Hu giving keynote lectures in eight cities across the country. Thousands of attendees received a rare inside look at *Mathematica* and a unique glimpse into the future of technical computing.

Each attendee also received a complimentary copy of the software as part of a broader program to provide *Mathematica* free to all those interested in China over the next two months. That program, the first of its kind from Wolfram Research, has already brought *Mathematica* to countless students, academics, and professionals of all backgrounds who are now learning how to incorporate it into their daily workflows.

According to a professor in Beijing, "*Mathematica* is the easiest and most powerful tool for programming, specialized applications, visualization, and equation solving of any kind." Wolfram Research will continue to support this fast-growing community with the latest technologies.

[wolfram.com/r/7016/china](http://wolfram.com/r/7016/china)



## platform **support**

### grid*Mathematica* on Windows® Compute Cluster Server

The new Cluster Integration Package for grid*Mathematica* enables affordable, out-of-the-box operation of grid*Mathematica* on Microsoft® Windows Compute Cluster Server 2003. It is now available as a free download to registered users of grid*Mathematica*.

[wolfram.com/r/7016/cip](http://wolfram.com/r/7016/cip)

### *Mathematica* Adds Universal Macintosh®, Linux Support

Wolfram Research has added *Mathematica* support for the newest Macintosh and Linux platforms.

The *Mathematica* Universal release capitalizes on the increased speed of the Intel® Core™ Duo processor chip and is able to run on both Intel and PowerPC Macs. *Premier Service* subscribers can contact Wolfram Research to obtain a copy of *Mathematica* 5.2 for the Intel Mac.

For Linux users, SuSE Professional 10 for Linux 64-bit systems and Red Hat Fedora Core 4 for Linux 32-bit systems are now supported platforms for *Mathematica* 5.2.

[wolfram.com/r/7016/platforms](http://wolfram.com/r/7016/platforms)

## now **in print**



*Complex Analysis with Mathematica*, by William Shaw

[wolfram.com/r/7016/shaw](http://wolfram.com/r/7016/shaw)



*Mathematica for Theoretical Physics: Classical Mechanics and Nonlinear Dynamics*, Second Edition, by Gerd Baumann

[wolfram.com/r/7016/baumann1](http://wolfram.com/r/7016/baumann1)



*Mathematica for Theoretical Physics: Electrodynamics, Quantum Mechanics, General Relativity, and Fractals*, Second Edition, by Gerd Baumann

[wolfram.com/r/7016/baumann2](http://wolfram.com/r/7016/baumann2)



*Continuum Mechanics Using Mathematica: Fundamentals, Applications, and Scientific Computing*, by Antonio Romano, Renato Lancellotta, and Addolorata Marasco

[wolfram.com/r/7016/romano](http://wolfram.com/r/7016/romano)



*A Beginner's Guide to Mathematica*, by David McMahon and Daniel M. Topa

[wolfram.com/r/7016/mcmahon](http://wolfram.com/r/7016/mcmahon)



*Bayesian Logical Data Analysis for the Physical Sciences: A Comparative Approach with Mathematica Support*, by Phil Gregory

[wolfram.com/r/7016/gregory](http://wolfram.com/r/7016/gregory)



*Biochemical Thermodynamics: Applications of Mathematica*, by Robert A. Alberty

[wolfram.com/r/7016/alberty](http://wolfram.com/r/7016/alberty)

## application **updates**



### *GeometricalGeodesy* <sup>NEW</sup>

A comprehensive framework for surveying and mapping applications with significant advantages for accurate numerical computation, exact symbolic analysis, and visual interpretation of results.

[wolfram.com/r/7016/geodesy](http://wolfram.com/r/7016/geodesy)



### *KNITRO for Mathematica* <sup>NEW</sup>

The industry standard for large-scale nonlinear optimization of problems, including business-process reengineering, production-line management, form-factor reduction, and integrated circuit layouts.

[wolfram.com/r/7016/knitro](http://wolfram.com/r/7016/knitro)



### *LensLab* <sup>NEW</sup>

An entry-level package for ray tracing, rendering, and analysis of simple and complex optical systems in *Mathematica*. In addition to a built-in library of lenses, mirrors, prisms, and gratings, a structuring language makes it possible to create and modify new components.

[wolfram.com/r/7016/lenslab](http://wolfram.com/r/7016/lenslab)



### *machine learning framework 1.5*

Adds new features for multi-method data mining projects and improves existing methods and cross-validation techniques. Now also available for Linux and Mac OS X.

[wolfram.com/r/7016/mlf](http://wolfram.com/r/7016/mlf)



### *MathCode C++ 1.3*

Now supports `Fourier` and `InverseFourier` commands, as well as complex functions, complex arrays, and a complex data type.

[wolfram.com/r/7016/mathcode](http://wolfram.com/r/7016/mathcode)



### *MathCode F90*

Expanded functionality enables the development of a wide variety of robust Fortran-90-based applications in *Mathematica*.

[wolfram.com/r/7016/mathcodef90](http://wolfram.com/r/7016/mathcodef90)



### *Rayica* <sup>NEW</sup>

Provides fine granularity and more control than other programs for modeling innovative optical instruments, including aspherical lenses, optical fibers, resonating cavities, and custom surfaces.

[wolfram.com/r/7016/rayica](http://wolfram.com/r/7016/rayica)



### *Statistical Inference Package* <sup>NEW</sup>

A robust new application package for building and analyzing complex statistical models in *Mathematica*. It contains a large collection of discrete and continuous univariate and multivariate distributions, with the flexibility to form complicated models from simpler ones.

[wolfram.com/r/7016/sip](http://wolfram.com/r/7016/sip)



### *UnRisk PRICING ENGINE 2.3*

Adds new financial instruments for swaps and two types of general steepeners, which are all multiple callable and puttable. It also now supports Monte Carlo simulation under the Hull-White model.

[wolfram.com/r/7016/unrisk](http://wolfram.com/r/7016/unrisk)

# Wolfram Technology Conference 2006

## At the Frontiers of Science and Technology

Be among the first to experience the new era of technical computing with *Mathematica* at the Wolfram Technology Conference 2006.

Led by Stephen Wolfram, senior Wolfram staff, and technology leaders from around the world, this year's conference will open the doors to a wide range of never-before-seen Wolfram technologies.

Sessions aimed at users of all levels will provide firsthand introductions to these exciting innovations and demonstrate how to use them in major academic and professional fields. In addition to technical talks from key developers and fellow users, the conference will feature hands-on workshops, tutorials, and special training opportunities from Wolfram Education Group.

*"If it's being considered in the scientific world, it will be discussed at the Wolfram conference. It's great to be part of groundbreaking interactions."*

*-David DeBrot, past presenter and conference attendee*

Take this opportunity to meet with the very people who develop *Mathematica*, forge new relationships with your colleagues, and present your own achievements. Submissions for talks and poster sessions will be considered through August 15. All users, from students to professionals in any field, are encouraged to contribute.

[wolfram.com/r/7016/wtc2006](http://wolfram.com/r/7016/wtc2006)

**WOLFRAM  
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CONFERENCE 2006**  
OCTOBER 12-14



## highlighted events

See the full Wolfram Research calendar at [www.wolfram.com/news/events](http://www.wolfram.com/news/events).

July 7, 2006



Preview the latest in *Mathematica* technology and how it will change education at the **Mathematica London Conference 2006**.

[wolfram.com/r/7016/london2006](http://wolfram.com/r/7016/london2006)

September 6, 2006



Join us in Switzerland to learn about the future of *Mathematica* at the **Mathematica Zurich Conference 2006**.

[wolfram.com/r/7016/zurich2006](http://wolfram.com/r/7016/zurich2006)

October 12-14, 2006



Register for the **Wolfram Technology Conference** and see the latest advances in technical computing at the Wolfram Research headquarters in Champaign, Illinois.

[wolfram.com/r/7016/wtc2006](http://wolfram.com/r/7016/wtc2006)

December 12, 2006



The **Japan Mathematica Conference 2006** is a rare opportunity to increase your knowledge of *Mathematica* and participate in the vibrant user community as *Mathematica* enters its new era.

[wolfram.com/r/7016/jmc](http://wolfram.com/r/7016/jmc)

July-September 2006



Sign up for a free online seminar on Wednesdays and Thursdays this summer, or register for an upcoming **Wolfram Education Group** training course from our calendar of offerings.

[wolfram.com/r/7016/weg](http://wolfram.com/r/7016/weg)

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