

# WOLFRAM EDUCATION SOLUTIONS

MATHEMATICA® TECHNOLOGIES FOR TEACHING AND RESEARCH

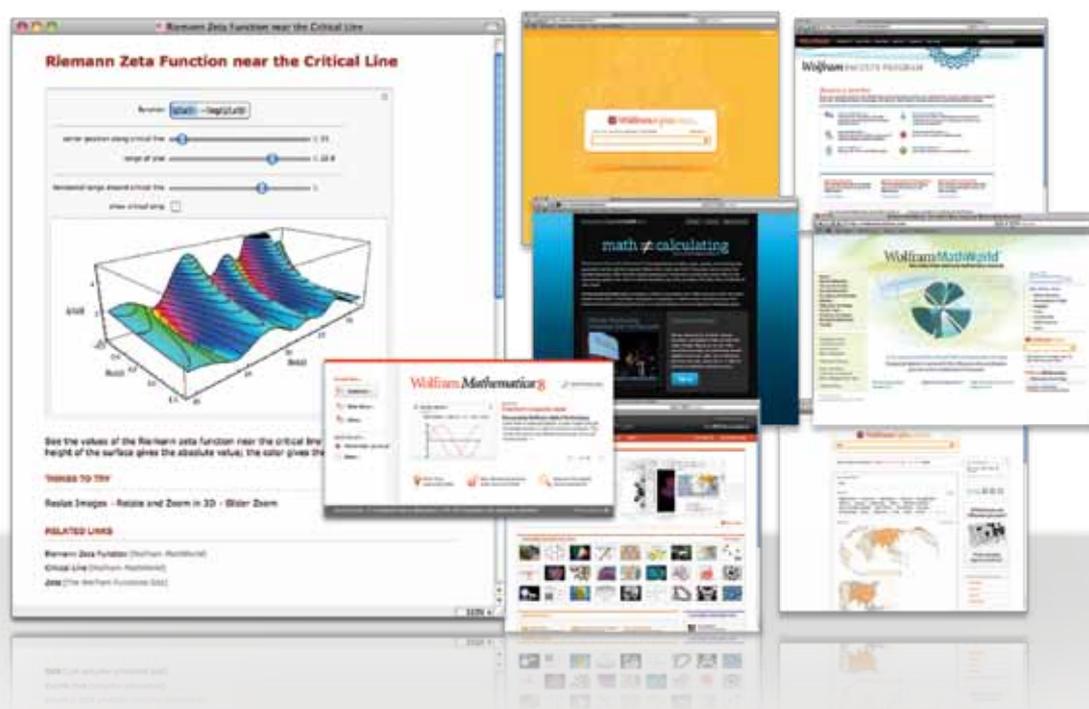


# About Wolfram Research

For over two decades, Wolfram Research has been dedicated to developing tools that inspire exploration and innovation. As we work toward our goal to make the world's data computable, we have expanded our portfolio to include a variety of products and technologies that, when combined, provide a true campuswide solution.

At the center is *Mathematica*—our ever-advancing core product that has become the ultimate application for computation, visualization, and development. With millions of dedicated users throughout the technical and educational communities, *Mathematica* is used for everything from teaching simple concepts in the classroom to doing serious research using some of the world's largest clusters.

Wolfram's commitment to education spans from elementary education to research universities. Through our free educational resources, STEM teacher workshops, and on-campus technical talks, we interact with educators whose feedback we rely on to develop tools that support their changing needs. Just as *Mathematica* revolutionized technical computing 20 years ago, our ongoing development of *Mathematica* technology and continued dedication to education are transforming the composition of tomorrow's classroom.



With more added all the time, Wolfram educational resources bolster pedagogy and support technology for classrooms and campuses everywhere. Favorites among educators include:

Wolfram|Alpha®, the Wolfram Demonstrations Project™, *MathWorld*™, the Wolfram Faculty Program, and ComputerBasedMath.org



**FOUNDER & CEO of WOLFRAM RESEARCH, STEPHEN WOLFRAM**  
and the **HOMEWORK DAY TEAM, 2009**

“ *Wolfram Research is one of the few software companies who still care about education.* ”

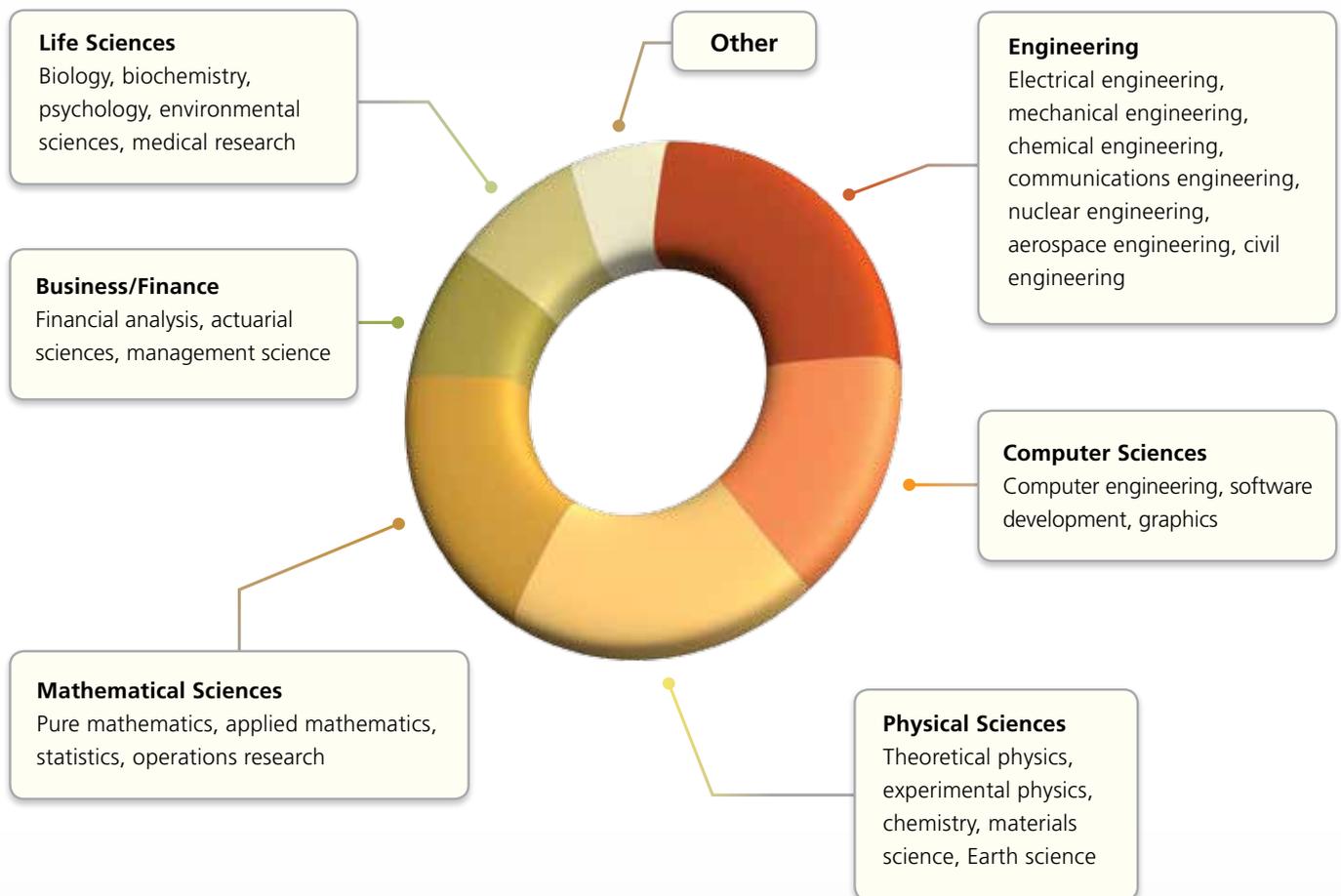
Homework Day Attendee

# The *Mathematica* Advantage

## The ultimate super tool for education and research

With enormous breadth and depth of application areas and functionality, *Mathematica* is a technical computing environment that can be used at all levels, cross-campus and cross-discipline—for teaching algebra, learning about economics, or collaborating on a large-scale research project in bioinformatics.

### MATHEMATICA USERS BY FIELD



“*Mathematica is a tool that schools should embrace early... and the earlier we get started the better. The students are a lot more invested in the process. They retain the concepts better... and appreciate how it can help them visualize what’s going on with their solutions and problems.*”

Chris Lee, Associate Professor of Mathematics  
ROANOKE COLLEGE

## Millions of dedicated users worldwide



- 100% of the world's top 200 universities have *Mathematica*
- 90% of the world's top 200 universities make *Mathematica* broadly available to students
- 98% of the top 50 U.S. liberal arts colleges have *Mathematica*
- 86% of the top 50 U.S. liberal arts colleges make *Mathematica* broadly available to students
- 100% of the Fortune 50 companies rely on *Mathematica* to maintain their competitive edge

“*Mathematica is the fastest and most accurate program I've ever used. It's a remarkably diverse collection of functionalities... the ultimate intellectual Swiss Army Knife.*”

David DeBroda, Senior Clinical Research Physician



### FOR TEACHING

*Mathematica* offers an interactive classroom experience that helps students explore and grasp concepts, plus gives you the tools you need to easily create supporting course materials, assignments, and presentations.



### FOR RESEARCH

Rather than requiring different toolkits for different jobs, *Mathematica* integrates the world's largest collection of algorithms, high-performance computing capabilities, and a powerful visualization engine in one coherent system, making it ideal for academic research in just about any discipline.

“*Mathematica is a self-contained environment where you can do all the things you need to do. The students author. They can write. They can calculate. They can draw graphics. They can do it all in one environment.*”

Debra Woods, Mathematics Professor  
UNIVERSITY OF ILLINOIS

# Teach Concepts, Not Keystrokes

## FREE-FORM INPUT

*Mathematica's* unique free-form input gets you working immediately, allowing you to focus on the concepts that you want to teach rather than spending valuable lecture time instructing your students on how to use a software program. When you enter commands in plain English, they are translated into precise *Mathematica* syntax, making it easy to learn the *Mathematica* language.

Instantly access *Mathematica's* load-on-demand curated data

graph of sin(x) from x=0 to 2pi  
`Plot[Sin[x], {x, 0, 2 * Pi}]`

literacy rate of uganda  
`CountryData["Uganda", "LiteracyFraction"]`  
0.668

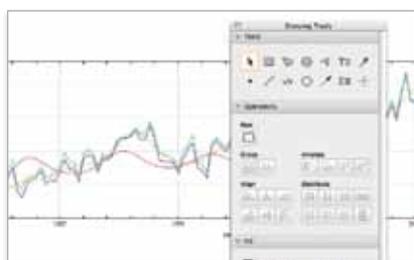
integral of 1/(x^3+1)  
`Integrate[1 / (x^3 + 1), x]`

Quickly visualize mathematical functions and surfaces, scientific data, and specialized objects

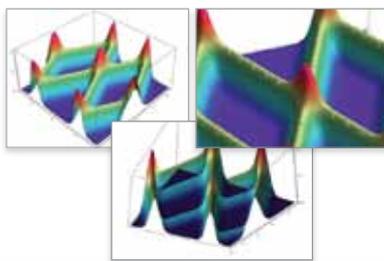
Immediately manipulate formulas, solve equations, and prove theorems

## ASSISTANT PALETTES AND DRAWING TOOLS

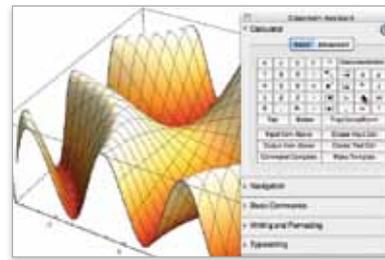
*Mathematica's* collection of Assistant palettes and drawing tools provide point-and-click access to an extensive range of *Mathematica* capabilities. The Assistant palettes serve as convenient entry points for novice users and shortcuts for experienced users.



Quickly annotate graphics with built-in drawing tools



Rotate, zoom, and pan graphics with a click of the mouse



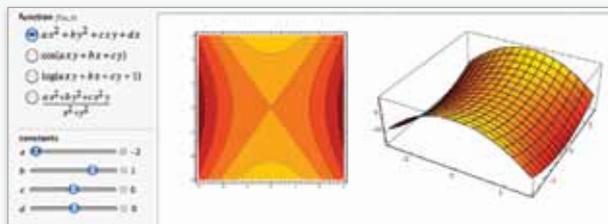
Use point-and-click palettes with interactive whiteboards

“ When you see a student say, ‘Oh, I get it,’ there’s nothing more satisfying for a teacher... The single command *Manipulate* allows you to build an interactive interface with sliders and buttons... It’s almost like a telescope into a world you couldn’t see otherwise. ”

Bruce Torrence, Chair, Department of Mathematics  
RANDOLPH-MACON COLLEGE

## BRING YOUR CLASSROOM TO LIFE

*Mathematica's Manipulate* command makes it easy to create interactive models for your classroom. Quickly turn static examples into dynamic models for exploring phenomena in real time—complete with slider bars, buttons, or check boxes—often with a single line of code.

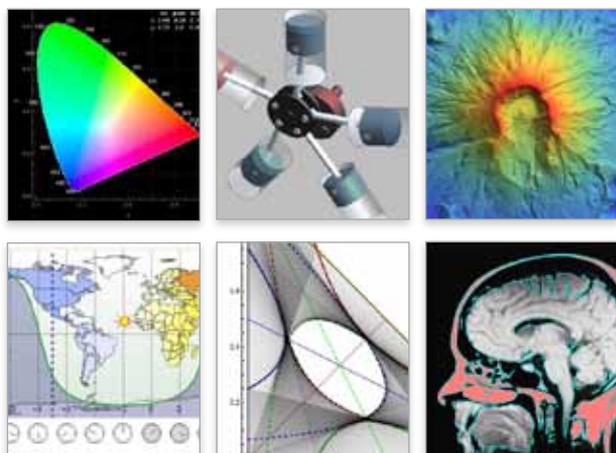


Dynamically interact with models in *Mathematica* or easily export them in any standard 3D graphics format.



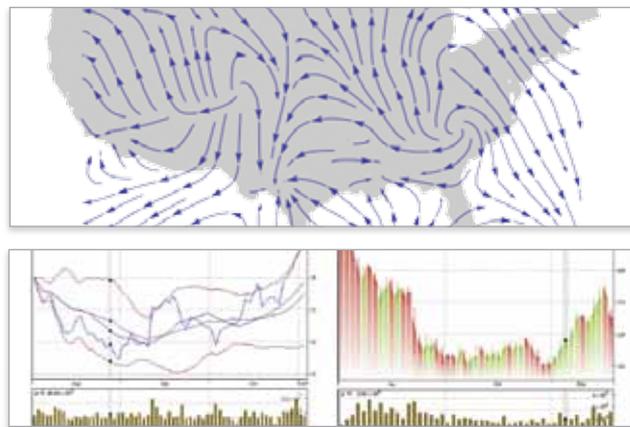
## UTILIZE PRE-MADE MODELS

Use *Mathematica* to dynamically interact with pre-made models from the Wolfram Demonstrations Project—a repository containing thousands of interactive examples from elementary education to front-line research. In addition, you can modify existing code or make your own Demonstrations. And with the free Wolfram *CDF Player*, you can share Demonstrations with anyone.



## MAKE PROBLEMS RELEVANT WITH REAL-WORLD DATA

Add relevancy and impact to your lessons with *Mathematica's* load-on-demand mechanism, which lets you download and use trillions of pieces of curated data from Wolfram Research, without any complicated database calls or connections. And with a simple click you can update your calculations with the latest data at any time—whether it's an hour from now or a year.



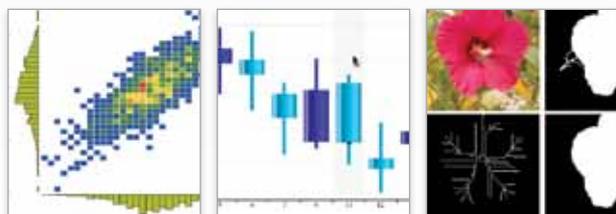
“There’s more and more pressure on the universities to offer real-world problems, and I think they’re not doing it because they don’t have the right tool... *Mathematica* is the tool, so you can get them [students] doing real research a lot more quickly. And that will be a transformation.”

Paul Abbott, Associate Physics Professor  
UNIVERSITY OF WESTERN AUSTRALIA

# The Ultimate Research & Development Environment

## ONE TOOL—MULTIPLE APPLICATION AREAS

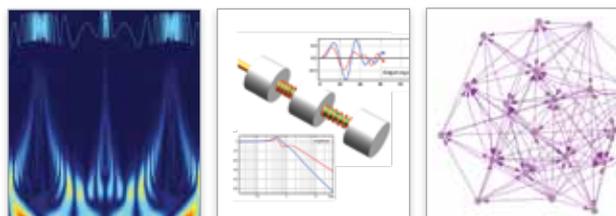
Unlike other systems that require you to purchase additional toolboxes for each specialized application area, *Mathematica* is a complete, integrated system with deep support for a broad range of specialties.



Statistics

Finance

Image Processing



Wavelets

Control Theory

Graph Theory

## PROGRAM THE WAY YOU THINK

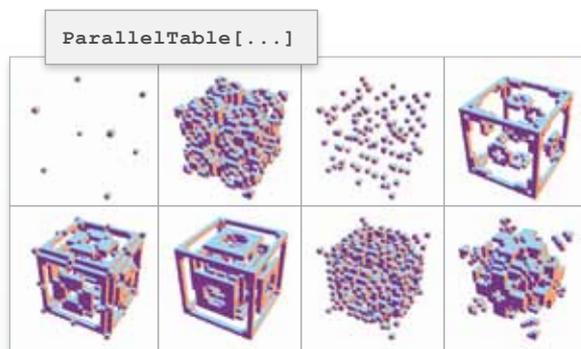
*Mathematica* stands out from traditional computer languages in simultaneously supporting many programming paradigms such as procedural, functional, rule-based, pattern-based, object-oriented, and more. This multi-paradigm approach gets you programming the way you think, not thinking about which way you need to program. Plus, support for such a broad range of constructs makes it a perfect choice for computer science curricula at all levels.

## EASILY INTERFACE WITH EXISTING DATA AND PROGRAMS

*Mathematica* provides robust support for a variety of data formats—numerical, textual, geometric, graphical, XML, even sound data—with the ability to extract individual elements of the data file for analysis. Live integration with SQL databases and languages including Java, .NET, and C/C++ makes it easy to immediately incorporate *Mathematica* into your existing infrastructure.

## HIGH-PERFORMANCE COMPUTING CAPABILITIES FOR LARGE DATASETS AND COMPLEX ANALYSES

On any multicore computer, *Mathematica* automatically runs multiple parts of a computation concurrently—making parallel computing easy enough for everyday use and powerful enough to handle even the largest datasets. *Mathematica*'s parallel infrastructure is set up to allow seamless scaling to networks, clusters, grids, and clouds, with straightforward support of many data-sharing models.



“*Mathematica* is very unique... by presenting results using interactive features in the visualizations... research can be more effective and more useful to the real systems. As more data... becomes available, we can instantly import it, redo our calculations, and get better results. Then, we can improve predictions and design better control policies.”

Zhilan Feng, Professor of Mathematics  
PURDUE UNIVERSITY

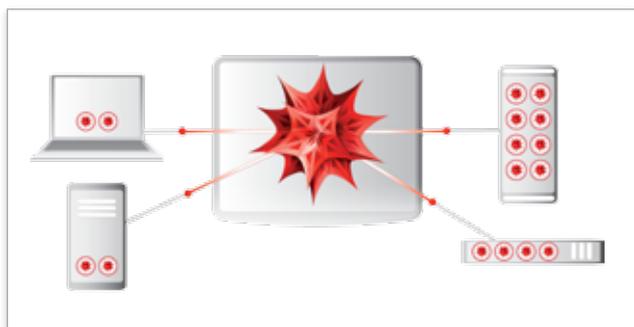
## INCREASE PERFORMANCE WITH OPTIMIZED GPU FUNCTIONS

*Mathematica* includes built-in support for CUDA and OpenCL environments, making GPU programming broadly accessible. GPU operations are fully integrated into the *Mathematica* system, including direct exchange of data between processes, and automatic compilation and linking of GPU code.



## DEPLOY ACROSS MANAGED AND AD-HOC CLUSTERS

For faster execution, run applications in parallel by deploying *Mathematica* across your managed clusters, such as CCS, HPC, LSF, PBS, and SGE. The built-in Wolfram Lightweight Grid™ System also provides a simple way to create an ad-hoc cluster out of dormant computers on your network.



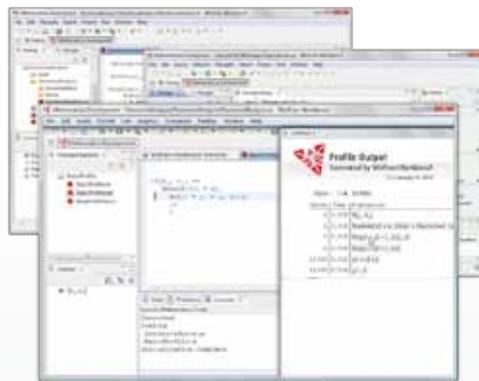
## DEVELOP AND COMPILE EXECUTABLES FROM YOUR MATHEMATICA PROGRAMS

*Mathematica* makes rapid development of production-quality code easy with automatic C code generation and compilation. Compile standalone, executable C code for use in other projects. Load external dynamic libraries directly into *Mathematica* for high-speed, memory efficient execution.



## MANAGE YOUR CODE BASE WITH WOLFRAM WORKBENCH™

Use Wolfram *Workbench* to edit and navigate code, debug programs at the source level, profile and test code execution, manage and deploy projects, and write documentation. *Workbench* integrates with *webMathematica*™, *gridMathematica*™, and *JLink*™, and can also plug in to your existing Eclipse installation.



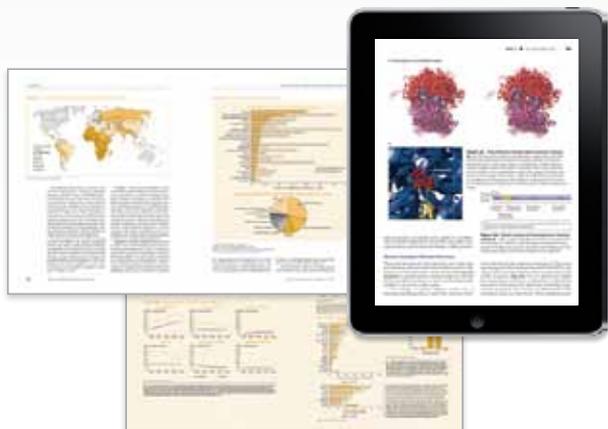
“*Mathematica is an excellent tool to communicate and enrich discussions. As a researcher I am able to explain to my peers my findings with Mathematica. Personally, what I like from Mathematica is the fact that you may take a concept or an equation from a paper or a book, you plug it into Mathematica and immediately it is 'alive'!*”

Diego Oviedo Salcedo, Instructor  
UNIVERSIDAD PONTIFICIA BOLIVARIANA, BUCARAMANGA

# Flexible Deployment Options

## AUTHOR, PUBLISH, AND SHARE YOUR WORK

With mathematical typesetting, document layout capabilities, citation management, and the ability to export to different document formats, *Mathematica* is a uniquely powerful authoring environment.



*Mathematica* notebooks have cross-platform compatibility, so you can share your work with your colleagues or students without worrying about differences between your system setup and theirs. You can also save your work in a universally accessible format, such as PDF or HTML, or LaTeX for submission to an academic journal.

## CREATE DYNAMIC AND PORTABLE DOCUMENTS

*Mathematica*'s document-creation capabilities coupled with its native interactivity allow you to create dynamic yet portable documents. Colleagues without *Mathematica* can access your work using the free *CDF Player* on their local machine or as a convenient browser plugin.

## BUILD A MATHEMATICA-BASED WEBSITE

*webMathematica* deploys high-powered *Mathematica* applications as interactive websites. It works seamlessly with modern web standards and services to add dynamic content and computations on the web.



## COMPUTE ON THE GO WITH MOBILE TECHNOLOGY

Mobile products—such as the WolframAlpha App and the Wolfram Course Assistant Apps—allow you on-demand access to computation from the convenience of your mobile devices. You can also develop interactive websites using the WolframAlpha Widget Builder or *webMathematica*—also viewable from mobile devices.



# Academic Licensing



## GROUP AND INSTITUTIONAL LICENSING

Whether you need *Mathematica* for two computers or 20,000, our flexible and affordable group and organization licensing programs include comprehensive access to *Mathematica* and multicore support, along with the following group benefits:

- Premier Service, providing free upgrades, technical support, and home-use licenses for faculty, staff, and researchers
- Expanded student home-use availability
- HPC and grid computing options
- Options for web deployment for distance learning/online programs
- Network licensing options providing unlimited installations and easy administration



## INDIVIDUAL LICENSING FOR FACULTY AND STAFF

*Mathematica* is easy to use and easy to license, so now's the perfect time to get started. All individual *Mathematica* licenses include:

- One year of individual Premier Service, providing free upgrades, technical support, and a home-use license
- Support for machines up to four cores
- Conveniently manage your licenses online via the Wolfram User Portal

# For Students



## INDIVIDUAL LICENSING FOR YOUR STUDENTS

Supplement your students' use of *Mathematica* in campus computer labs with *Mathematica for Students*, a fully functional version of *Mathematica* that lets students continue their work on their own computers.

## STANDARD EDITION

Students get *Mathematica* throughout their entire student career, plus qualify for a deep discount for a professional license upon graduation.

## STUDENT BUNDLE

Get all the functionality of the Standard Edition, plus the tutorial video series "M10: A Student's First Course in *Mathematica*," for a special bundled price. Only available at the Wolfram Web Store.

## SEMESTER AND ANNUAL EDITION

Utilize the latest version of *Mathematica* on a convenient time-limited basis: semester and annual editions are available.

# Contact Us Today

Call or email to discuss what licensing benefits you already have available and/or what new options will work best for you and your students. We will help you mix and match from all eligible Wolfram products to build the optimal solution for you and your organization.

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