

# WOLFRAM TECHNOLOGY FOR EDUCATION



“ We’re proud to offer powerful knowledge-based computing solutions that inspire world-class research and education—across all fields and at all educational levels. ”

—Stephen Wolfram  
Founder and CEO

# ABOUT WOLFRAM

Creating technologies that have the potential to change the world



Founded by Stephen Wolfram in 1987, Wolfram Research is one of the world's most respected computer, web and cloud software companies—as well as a powerhouse of scientific and technical innovation.

Wolfram is proud to support education and research at top schools worldwide. Wolfram's flagship Mathematica system has been a central tool for education across a variety of STEM disciplines, and now has millions of dedicated users around the world. Over the years, Wolfram has added Wolfram|Alpha, Wolfram Programming Lab and other products, and continues to apply its technology to deliver uniquely powerful solutions for education—across fields and at all educational levels.

Today, Wolfram's dramatically expanded offerings for schools, colleges and universities bring the power of deep but easy-to-use computation to areas that have never been able to benefit from computation before—opening up major opportunities to create innovative curricula that use Wolfram tools to integrate learning and research across departments.

## Defining New Directions for Education

Just as our flagship product Mathematica revolutionized technical computing, our ongoing development of Wolfram technology and continued dedication to education are transforming the composition of tomorrow's classroom.

The landscape of education is changing—a shift from in-person classes to blended or hybrid classes that mix face-to-face learning and online sessions.

Now more than ever, it's important to invest in a computational technology for use both on and off campus. Thousands of faculty and students are using Wolfram technology both on the desktop and in the cloud specifically for these hybrid courses, providing maximum access to anyone, from anywhere.

**WOLFRAM|ALPHA**  
[wolframalpha.com](http://wolframalpha.com)

**WOLFRAM + RASPBERRY PI**  
[wolfram.com/raspberry-pi](http://wolfram.com/raspberry-pi)

**COMPUTER-BASED MATH**  
[computerbasedmath.org](http://computerbasedmath.org)

**WOLFRAM FUNCTION  
REPOSITORY**  
[resources.wolframcloud.com/  
FunctionRepository](http://resources.wolframcloud.com/FunctionRepository)

**WOLFRAM DEMONSTRATIONS  
PROJECT**  
[demonstrations.wolfram.com](http://demonstrations.wolfram.com)

# THE WOLFRAM TECHNOLOGY SYSTEM

Enrich teaching and research across campus with the power of Wolfram tools

The Wolfram Technology System comprehensively delivers both classic and new Wolfram technologies to researchers, educators and students across campus. Below are some of the products most commonly included in the Wolfram Technology System.

## Products



**FEATURED**  
**MATHEMATICA | DESKTOP**

The definitive tool for technical education and research, dramatically expanded with access to the cloud. 🎓 🌱 🧑🏫 🧑🎓



**FEATURED**  
**MATHEMATICA | ONLINE**

Zero-configuration Mathematica running through a web browser in the cloud. 🎓 🌱 🧑🏫 🧑🎓



**FEATURED**  
**WOLFRAM|ALPHA PRO**

The ideal instant computation tool for students in all fields. 🎓 🌱 🧑🏫 🧑🎓



**WOLFRAM|ONE**

The world's first fully cloud-desktop hybrid, providing ideal access to the full repertoire of Wolfram technology. 🎓 🌱 🧑🏫 🧑🎓



**WOLFRAM|ALPHA NOTEBOOK EDITION**

The simplicity of Wolfram|Alpha with the dynamic classroom capabilities of Mathematica. 🧑🏫 🧑🎓



**WOLFRAM SYSTEM MODELER**

State-of-the-art professional systems engineering, integrated with Wolfram technologies. 🎓



**WOLFRAM PROGRAMMING LAB**

Introduce computation and programming using the unique power of the Wolfram Language. 🎓 🌱 🧑🏫 🧑🎓



**WOLFRAM ENTERPRISE PRIVATE CLOUD**

Apply the full power of Wolfram computation to your private data, utilizing your existing infrastructure. 🎓 🌱



**WOLFRAM FINANCE PLATFORM**

State-of-the-art professional finance computation. 🎓



**OTHER WOLFRAM PRODUCTS**

- Wolfram Development Platform
- Wolfram Mathematica Add-ons
- Wolfram Mobile Apps
- Wolfram U
- Wolfram Paid Project Support



**WOLFRAM WORKBENCH**

Develop and maintain large-scale systems based on the Wolfram Language. 🎓

Wolfram technologies available for



RESEARCH UNIVERSITIES



COLLEGES & TEACHING UNIVERSITIES



JUNIOR & COMMUNITY COLLEGES



HIGH SCHOOLS & SECONDARY SCHOOLS

# MATHEMATICA | DESKTOP

Redefining classroom learning and academic research—in person, online or a mix of both

Mathematica offers a complete environment for teaching and research that seamlessly combines a powerful calculation and dynamic visualization engine with an intuitive user interface that makes it easy for anyone to get started. And because Mathematica also includes built-in documentation and presentation tools, it's perfect for creating course and project materials. Now there's no need to jump between different programs to get your work done. And uniform access to Mathematica will ensure your students have the same classroom experience in face-to-face classes or through remote learning.

## GET STARTED QUICKLY

Mathematica makes it easy to get started, so you can focus on the concepts that you want to teach rather than spending valuable time showing students how to use the software. Enter commands in free-form English, and get suggestions for entering Wolfram Language code, ideas for what to do next and templates for entering calculations.

## COMPUTE AND VISUALIZE JUST ABOUT ANYTHING

Mathematica has thousands of built-in functions covering algebraic manipulation to visualization, and everything in between.

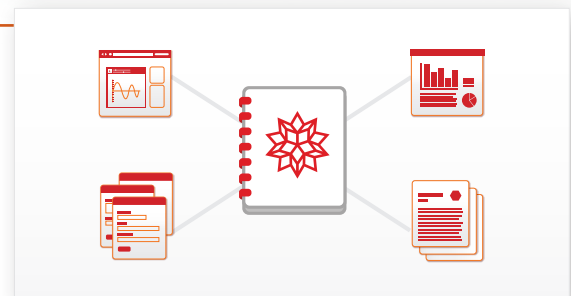
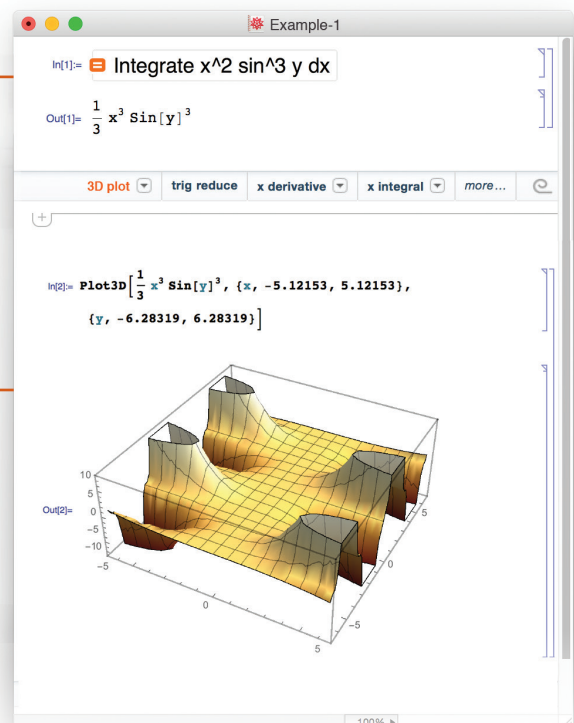
Equation Solving	Algebraic Manipulation	Geometric Computation
Mathematical Computation	Data Analysis	Sound Analysis
Numerics Visualization	Graph Computation	Geographic Computation
Engineering Computation	Scientific Computation	Time Series
	Image Computation	Financial Computation

## PLAN, PRESENT AND SHARE

Imagine creating interactive course materials that let students manipulate and recalculate results live and then present to a group or send back to you for grading. That's the power of Wolfram Notebooks.

## SHOW STUDENTS THE “BIG PICTURE”

Shift conversations in the classroom from “how do I solve the problem” to “what would happen if . . .” Mathematica lets you quickly turn static examples into dynamic models to explore phenomena in real time—often with a single line of code. Or utilize existing Demonstrations, from thousands available for free from the Wolfram Demonstrations Project.





“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, USA





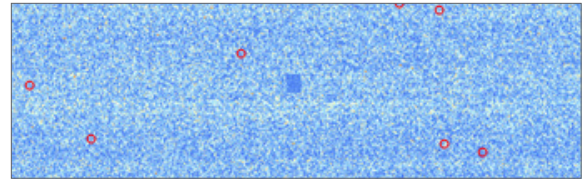
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6 -> 6, 1 -> 1, 1 -> 1, 7 -> 7, 8 -> 8, 5 -> 5, 0 -> 0, 4 -> 4, 7 -> 7,
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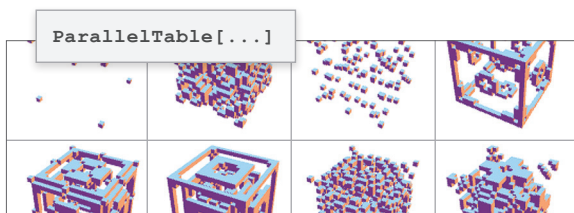
### AUTOMATED MACHINE LEARNING

Mathematica offers highly automated machine learning, as well as a variety of built-in classifiers for common machine-learning tasks.



### DATA HANDLING AND BIG DATA SUPPORT

Mathematica can handle extremely high-level array operations on large datasets of any dimension of structure, with support for out-of-core data processing. Data can be viewed and edited through a spreadsheet-like interface to easily identify individual elements to extract for analysis.



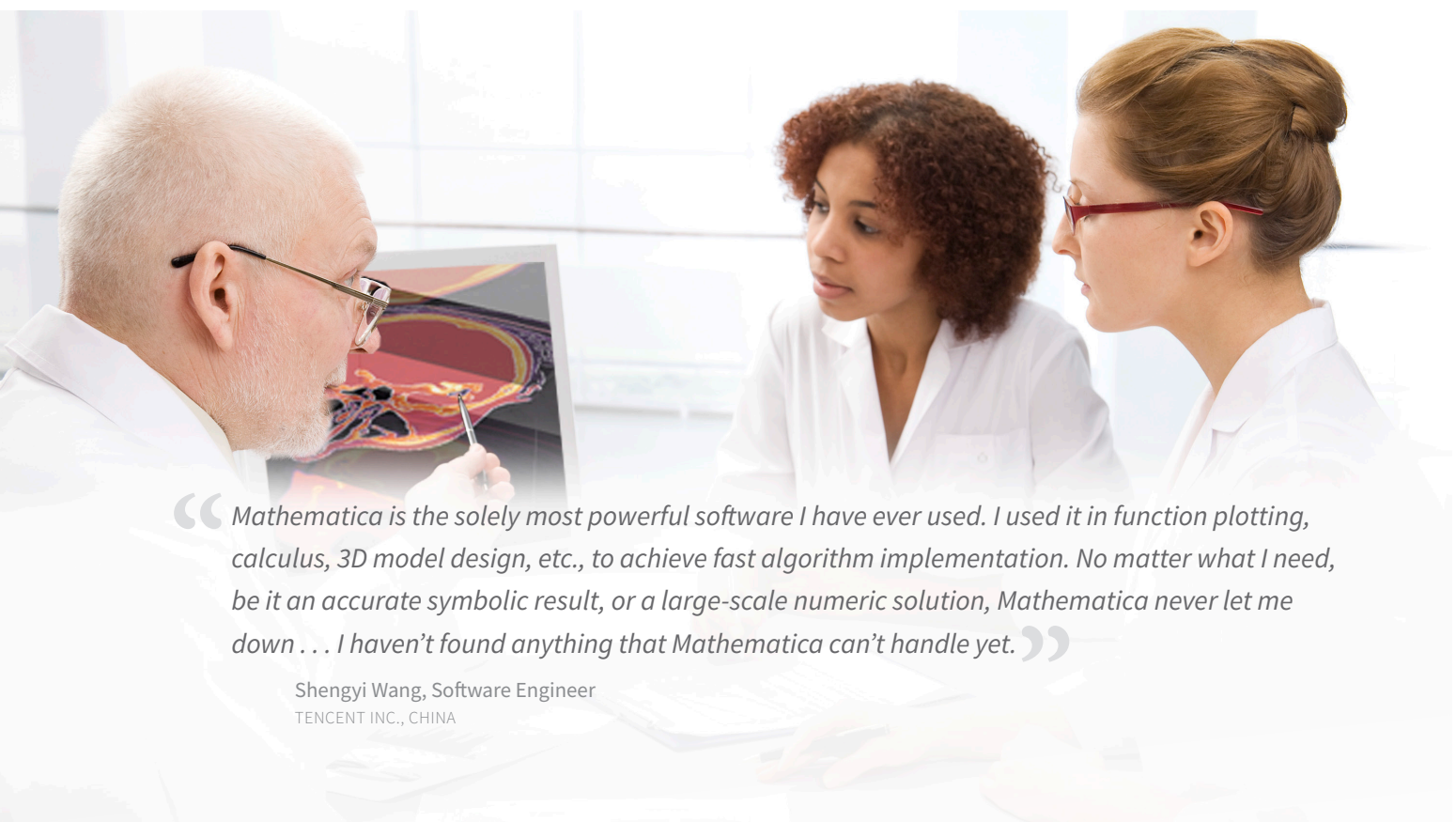
### INCREASE PERFORMANCE WITH PARALLEL COMPUTING

Mathematica automatically runs multiple parts of a computation concurrently on multicore computers—enabling powerful parallel computing to handle even the largest datasets. With seamless scaling to networks, grids, cloud, and ad-hoc and managed clusters such as CCS, HPC, LSF, PBS and SGE, Mathematica also supports many data-sharing models and distributed application frameworks, including Hadoop.



### EASILY INTERFACE WITH EXISTING DATA AND PROGRAMS

Mathematica provides robust support for both relational and non-relational databases and a variety of data formats—numerical, textual, geometric, graphical, XML and even sound data. Live integration with SQL databases and languages including R, Java, .NET and C/C++ makes it easy to immediately incorporate them into your existing infrastructure.



“ Mathematica is the solely most powerful software I have ever used. I used it in function plotting, calculus, 3D model design, etc., to achieve fast algorithm implementation. No matter what I need, be it an accurate symbolic result, or a large-scale numeric solution, Mathematica never let me down . . . I haven't found anything that Mathematica can't handle yet. ”

Shengyi Wang, Software Engineer  
TENCENT INC., CHINA

# MATHEMATICA | ONLINE

The world's ultimate computation system meets the modern cloud environment

Ideal for course development and deployment, Mathematica | Online brings the power of Mathematica, the versatility of Wolfram Notebooks and the flexibility of the Wolfram Language to the cloud.

Mathematica | Online makes it possible to calculate, visualize, program and create interactive Wolfram Notebooks directly in your web browser—with no installation or configuration required. And built-in collaboration tools let faculty across multiple campuses work with each other on their projects and share their content with students across town or across the globe. Whether you're wanting to incorporate dynamic computation and interactive documents into your course management system or add an online element to existing traditional courses, think Mathematica | Online.



COMPUTATION | KNOWLEDGE  
PROGRAMMING | COLLABORATION  
CONNECTIVITY | AUTHORING



Improve accessibility for faculty and students with online access from anywhere, anytime.



Improve workflows for users to easily move between desktop and mobile devices.



Reduce spending on technology infrastructure for costly lab hardware and software update rollouts.



Share documents and collaborate with colleagues and students around the globe.



Support online and distance learning courses with 24/7 access to embeddable, interactive documents.



Secure your confidential data with private cloud options available.

# WOLFRAM|ALPHA PRO

Instantly compute answers and access knowledge online

Wolfram|Alpha Pro makes it easy to introduce students to computation across a wide array of disciplines, and quickly gets them exploring concepts and thinking critically. This online computational knowledgebase lets you calculate and visualize answers online through a web browser from anywhere on or off campus.

The screenshot displays the Wolfram|Alpha Pro interface for the query "integrate cos^2(x)". The main results area shows the indefinite integral:  $\int \cos^2(x) dx = \frac{1}{2}(x + \sin(x)\cos(x)) + \text{constant}$ . Below this, there are plots of the integral and Riemann sums. A "Step-by-step solution" window is overlaid on the right, showing the following steps:

**Indefinite integrals:**

**STEP 1**  
Take the integral:  
 $\int \cos^2(x) dx$

**STEP 2**  
Write  $\cos^2(x)$  as  $\frac{1}{2}\cos(2x) + \frac{1}{2}$ :  
 $= \int \left( \frac{1}{2}\cos(2x) + \frac{1}{2} \right) dx$

**STEP 3**  
Integrate the sum term by term and factor out constants:  
 $= \frac{1}{2} \int \cos(2x) dx + \frac{1}{2} \int 1 dx$

**STEP 4**  
For the integrand  $\cos(2x)$ , substitute  $u = 2x$  and  $du = 2 dx$ :  
 $= \frac{1}{4} \int \cos(u) du + \frac{1}{2} \int 1 dx$

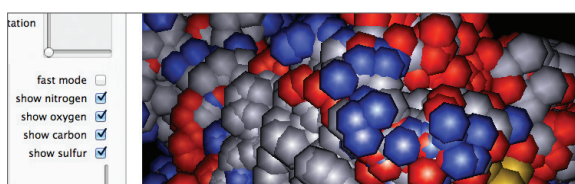
Buttons for "Next step" and "Show all steps" are visible at the bottom of the overlay.

“While I fully appreciate the value of understanding calculation and being able to crunch numbers by hand, tools like Wolfram|Alpha have made it possible for me to get students past the rote memorization of computational algorithms.”

Diego Oviedo-Salcedo, Instructor  
UNIVERSIDAD PONTIFICIA BOLIVARIANA, BUCARAMANGA

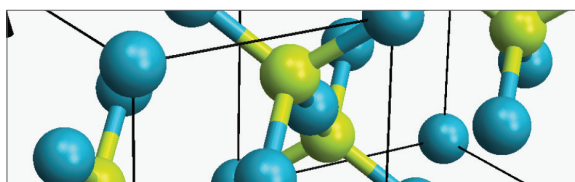
# USE CROSS-CAMPUS AND CROSS-DISCIPLINE

With enormous breadth and depth of application areas and functionality, Wolfram technology can be used at all levels, cross-campus and cross-discipline. A mainstay of the world's major academic institutions for more than a quarter of a century, Wolfram technology was initially most popular in departments such as mathematics and physics. Since then, Wolfram technology use has expanded to computer science and engineering, life and social sciences, business and finance, and across campuses.



## BIOLOGY & LIFE SCIENCES

Introduce quantitative methods and prepare your students for the computational future with instant access to state-of-the-art visualization, bioinformatics, statistics and modeling—as well as chemical and biological data.



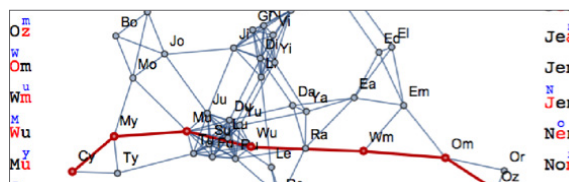
## CHEMICAL SCIENCES

From homework calculations with built-in chemical data to classroom demonstrations and experimental data capture, Wolfram tools let your students apply modern computation to chemistry.



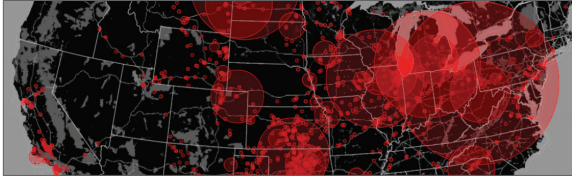
## BUSINESS/FINANCE/ACCOUNTING

Wolfram tools provide a unique way to teach business students modern quantitative and computational thinking as well as support state-of-the-art quantitative finance, business modeling and analytics.



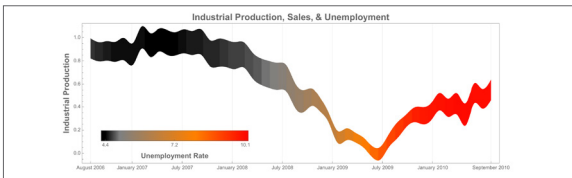
## COMPUTER SCIENCE

With its high level of automation and built-in knowledge, the Wolfram Language gives students a uniquely accessible new path to modern computer science and computational thinking.



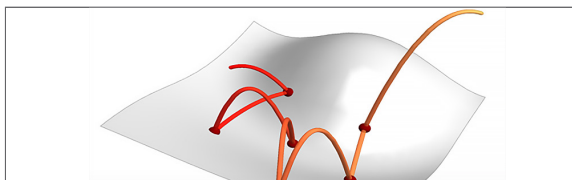
## DATA SCIENCE

With their broad array of built-in analytical tools and curated data—and immediate scaling from small to large data—Wolfram products are ideally suited to research and education in data science.



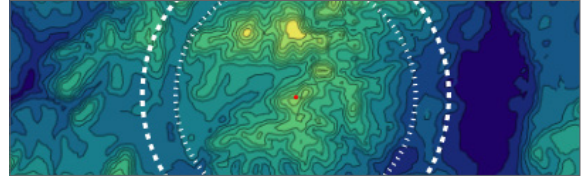
## ECONOMICS

Wolfram tools provide a unique environment for students to engage directly with real-world economics data and do their own computations, simulations and more.



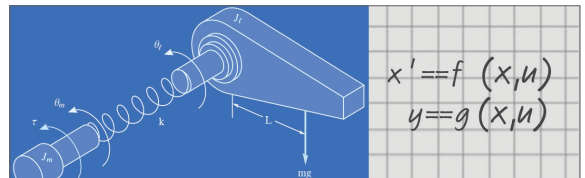
## MATHEMATICAL SCIENCES

For both math majors and others, Wolfram products provide the essential computational backbone to teach mathematical thinking and skills, and aid understanding of all forms of math subject matter.



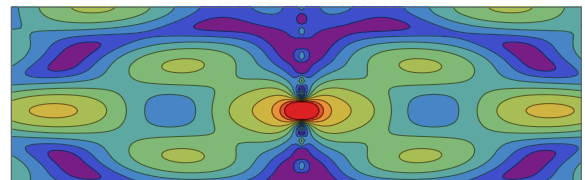
## EARTH & ENVIRONMENTAL SCIENCE

Expose your students to real-world earth and environmental science computations, with extensive built-in data and feeds, as well as working with geodesy and connecting to sensor devices.



## ENGINEERING

From homework calculations to real-world design projects, students can use Wolfram tools—with their wealth of built-in knowledge, algorithms and device connectivity—across all areas of engineering.



## PHYSICAL SCIENCES

From classroom simulations to homework calculations, Wolfram tools provide the essential computations and data for physics, and now also allow direct connection to experimental apparatus.

# BENEFITS FOR THE ENTIRE CAMPUS

Bring Wolfram's powerful, knowledge-based computing solutions to students and faculty across campus, conveniently delivering the best technology for education and research.

## For Students

### **THE TECHNOLOGY CHOICE THROUGHOUT A STUDENT'S CAREER**

The Wolfram Technology System can be used by students at all levels . . . from secondary school to post-graduate.

### **ADOPT THE INDUSTRY STANDARD**

Used heavily in industry and government, Wolfram technologies provide students with important knowledge and skills they'll use later in their careers.

## For Faculty

### **MINIMIZE CLASS PREP TIME**

Wolfram technologies are interactive and easy to use, allowing you to create on-the-fly visualizations during class that are based on student questions and work with a wide variety of learning styles. And with over 11,000 interactive visualizations available for free download, you can embed pre-made examples into your own lessons immediately rather than re-creating them from scratch.

### **ONE LANGUAGE, MULTIPLE USES**

The Wolfram Technology System combines a set of teaching and research tools unified by the Wolfram Language. This means you'll save time by learning a single language that you can use for both classroom and research projects.

## For IT Departments

### **SUPPORT FOR A DIVERSE INFRASTRUCTURE**

Save IT time and overhead by eliminating technology that only runs on one type of system. The Wolfram Technology System includes a variety of local installation and cloud-based deployment options that support your diverse IT infrastructure.

### **REPLACE NICHE TECHNOLOGY**

Rather than purchasing specialized software for each department or type of course, Wolfram technologies can be used in a variety of departments on campus, allowing you to replace niche software packages and save money.

## For Administrators

### **SAVE MONEY, MAXIMIZE ACCESS**

Consolidate individual departmental Wolfram technology purchases with the Wolfram Technology System, a complete solution that saves money and maximizes access.

### **INSPIRE INNOVATION**

Linked to many major research breakthroughs and emerging fields, Wolfram technologies provide the science, technology and tools that inspire future leaders in science and technology, and help to shape their discoveries.

### **JOIN THE ELITE**

Wolfram technologies are used by all of the world's top-ranked research universities, R&D organizations and government labs. This means that when you adopt the Wolfram Technology System, you're providing your campus community with access to the same technology used by innovators worldwide.

### **USE CROSS-DISCIPLINE, CROSS-CAMPUS, THROUGHOUT AN ENTIRE SYSTEM**

The Wolfram Technology System provides a cross-discipline solution that inspires innovation, allowing faculty and staff to collaborate across research projects, departments, colleges and campuses.

## Access Wolfram Tech with Maximum Control and Minimal Effort

Providing Wolfram tech to faculty, staff and students is easy—with no need to manually fulfill requests or manage users. When paired with your institution's authentication system, Wolfram's single sign-on (SSO) support allows users to log in with their institutional credentials and instantly gain access to online Wolfram tech only for as long as they're employed by or studying at your organization.

## Other Ways We Integrate with Your Infrastructure

Wolfram tech integrates with:



**DESKTOP AND LAPTOP COMPUTERS**  
running Windows, macOS and Linux



**CHROMEBOOKS**



**TABLETS AND  
MOBILE DEVICES**



“Our students should have access to these powerful tools, because it can advance science. Computing in general and Mathematica in particular open many ways to ‘condense’ very difficult previous scientific learning into tools usable by many people.”

Keith Stroyan, Mathematics Professor  
UNIVERSITY OF IOWA

# LICENSING OPTIONS

## Group and Organizational Licensing

Whether you're licensing Wolfram technologies for your entire organization, department or workgroup, you're sure to find a plan that fits your needs. Our flexible and affordable volume-purchase and site-license programs feature a variety of benefits for users, IT department staff and administrators.

Products may be site-licensed individually or as part of Wolfram Technology Systems, which are custom configured for a variety of institutions and provide campuswide access to Wolfram technologies.

Wolfram Technology Systems for . . .



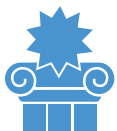
### RESEARCH UNIVERSITIES

Bring Wolfram's powerful knowledge-based computing solutions to students and faculty across campus, conveniently delivering the best technology for education and research.



### COLLEGES & TEACHING UNIVERSITIES

Unify your computing solutions with Wolfram technologies—conveniently delivering multidisciplinary instruction with the best real-world tools.



### JUNIOR & COMMUNITY COLLEGES

Engage your students with interactive demonstrations and self-paced computer labs—and use Wolfram tools to provide custom tutor-like solutions to students at all levels of proficiency.



### HIGH SCHOOLS & SECONDARY SCHOOLS

Give your students an advantage with the best technology, bringing STEM subjects to life—and now introducing broadly accessible programming education.

## Individual Licensing



### FOR FACULTY

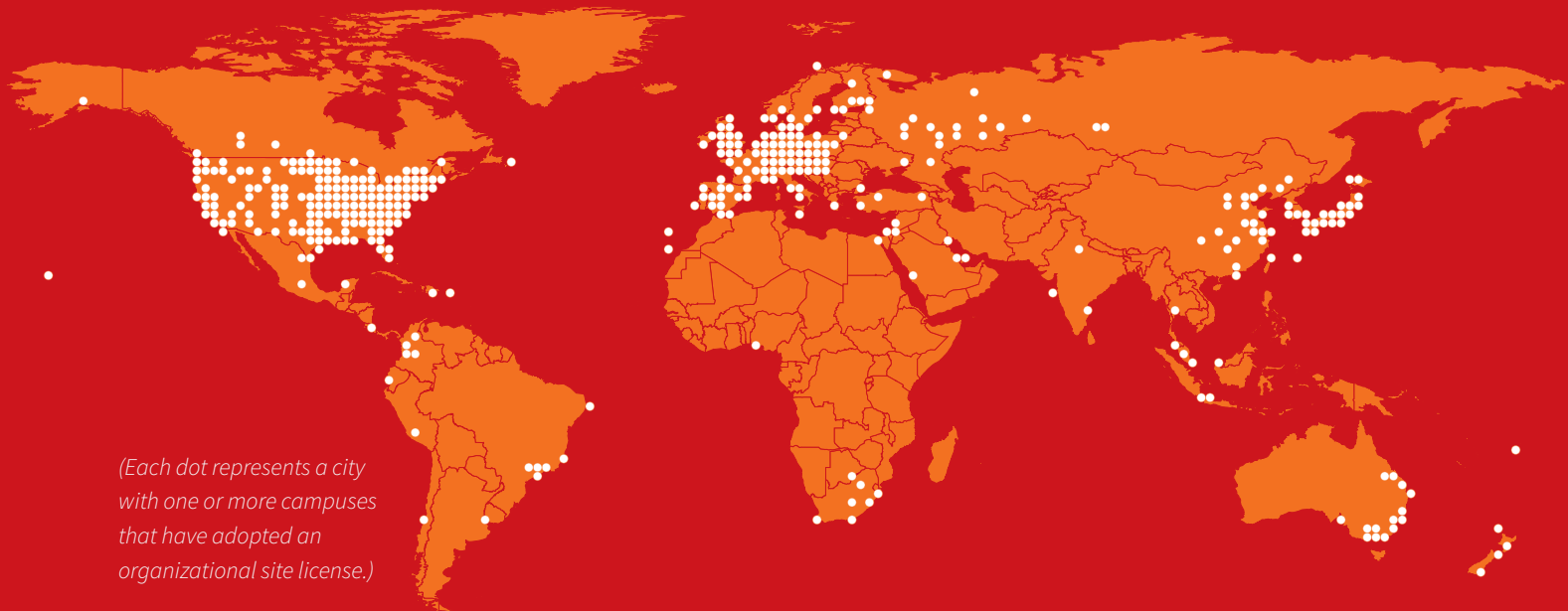
Wolfram products are easy to use and easy to license. Choose from annual or perpetual licenses, all bundled with one year of service for free upgrades, personal technical support, home-use licensing and more.



### FOR STUDENTS

Supplement your students' use of Wolfram products in campus computer labs with semester, annual or perpetual Student Editions, fully functional versions that let students continue their work on their own computers.

# JOIN MILLIONS OF USERS WORLDWIDE



For more than a quarter of a century, Wolfram products have redefined “state of the art” in technical computing—and provided the principal computation environment for millions of innovators, educators, students and others around the world.

100% of the Fortune 50 companies rely on Mathematica to maintain their competitive edge.

100% of the world’s top 200 universities have Mathematica.

1 in every 8 Physics Nobel Laureates since 1980 have used Wolfram technology.

Over 15 million people worldwide access Wolfram|Alpha each month.

The Wolfram|Alpha app is consistently top ranked in all app stores.

Wolfram technology has been used for fashion design, movie and game animations, Olympic stadium design, mathematical content for TV shows and even on the space station.

# CONTACT US TODAY

Let our educational innovation specialists help you pick the right mix of technologies for educators, researchers, administrators and students at your campus.

→ [www.wolfram.com/education](http://www.wolfram.com/education)

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