

NOVA scienceNOW™

**List of segments
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Coded to match the COPUS Year of Science 2009 themed months.
Look for the green “YOS month” tags next to topic names, or search this
document using Acrobat Reader’s “Find” function in the “Edit” menu.

YOS themes can be found at:

http://www.copusproject.org/yearofscience2009/themed_approach.php

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Episode 1, January 2005

Mirror Neurons (www.pbs.org/nova/sciencenow/3204/01.html) YOS month: December

A recently discovered system in the brain may help explain why we humans can get so worked up watching other people.

Hurricanes (www.pbs.org/nova/sciencenow/3204/02.html) YOS month: March, June, August

Predicting a hurricane's intensity is notoriously difficult, but new tools may make it easier.

Profile: James McLurkin (www.pbs.org/nova/sciencenow/3204/03.html) YOS month: March

James McLurkin of MIT is one of the world's leading designers of robot "swarms"—groups of robots that work together for a greater purpose.

Booming Sands (www.pbs.org/nova/sciencenow/3204/04.html) YOS month: March, October

Scientists look into a generations-old conundrum: how and why do certain sand dunes produce mysterious noises?

Episode 2, April 2005

Little People of Flores (www.pbs.org/nova/sciencenow/3209/01.html) YOS month: February

The remains of three-foot-tall humans are discovered on a remote Indonesian island.

T. Rex (www.pbs.org/nova/sciencenow/3209/02.html) YOS month: February

An astonishing adolescent growth spurt accounts for T. rex's enormous size.

Profile: Naomi Halas (www.pbs.org/nova/sciencenow/3209/03.html) YOS month: March, November

Naomi Halas is a pioneering nanotechnologist bent on seeing practical applications for her work—and soon.

Stem Cells (www.pbs.org/nova/sciencenow/3209/04.html) YOS month: December

What are they, and how do we find a balance between hope for cures and respect for life?

Frozen Frogs (www.pbs.org/nova/sciencenow/3209/05.html) YOS month: February, December

The common wood frog freezes solid every winter and then, come spring, defrosts and mates.

Episode 3, July 2005

Fuel Cells (www.pbs.org/nova/sciencenow/3210/01.html) YOS month: April, May, November

Hydrogen fuel cell cars promise pollution-free driving, but will we see them anytime soon?

RNAi (www.pbs.org/nova/sciencenow/3210/02.html) YOS month: February, December

A wayward petunia leads to the discovery of modest little molecules with enormous medical promise.

Fastest Glacier (www.pbs.org/nova/sciencenow/3210/03.html) YOS month: May, June, August

A glacier moving way too fast reveals how unpredictable the effects of global warming can be.

Profile: Brothers Chudnovsky (www.pbs.org/nova/sciencenow/3210/04.html) YOS month: March

The story of two brilliant mathematicians, a unicorn, and a homemade supercomputer.

Episode 4, October 2005

Artificial Life (www.pbs.org/nova/sciencenow/3214/01.html) **YOS month: February, September, Nov.**
Are scientists on the verge of making living things from little more than dust?

Lightning (www.pbs.org/nova/sciencenow/3214/02.html) **YOS month: July, August, October**
Experts still aren't sure what triggers it, but they suspect cosmic rays from outer space.

Profile: Erich Jarvis (www.pbs.org/nova/sciencenow/3214/03.html) **YOS month: December**
The work of neuroscientist Erich Jarvis demonstrates the power of open-mindedness in the lab.

Fish Surgery (www.pbs.org/nova/sciencenow/3214/04.html) **YOS month: September, December**
Veterinary medicine has caught up with Americans' love for their number one choice of pet, the fish.

Don't Ask the Expert: Neil deGrasse Tyson (www.pbs.org/nova/sciencenow/3214/05.html)
Neil deGrasse Tyson has a bone to pick with Hollywood aliens.

Hurricane Katrina (www.pbs.org/nova/sciencenow/3214/06.html)
Our January 2005 segment on New Orleans' risk from hurricanes proved sadly prescient, as this update reveals.

Episode 5, January 2006

10th Planet (www.pbs.org/nova/sciencenow/3302/01.html) **YOS month: July**
A stunning discovery at the far reaches of our solar system raises questions about what makes a planet a planet.

Twin Prime Conjecture (www.pbs.org/nova/sciencenow/3302/02.html)
New insight into a 2,300-year-old mystery surrounding prime numbers inspires a song.

Ivory-Billed Woodpecker (www.pbs.org/nova/sciencenow/3302/03.html) **YOS month: September**
An enchanting bird believed extinct mysteriously reappears ... maybe.

Pandemic Flu (www.pbs.org/nova/sciencenow/3302/04.html) **YOS month: February, December**
Will the virus that causes bird flu develop the ability to move from person to person?

Lab Meat? (www.pbs.org/nova/sciencenow/3302/05.html) **YOS month: February, May**
Scientists can grow edible meat in the laboratory from a few animal cells. Bon appétit?

Stem Cells Update (www.pbs.org/nova/sciencenow/3302/06.html) **YOS month: December**
A new technique for creating stem cells may ease ethical concerns.

Stronger Hurricanes (www.pbs.org/nova/sciencenow/3302/07.html) **YOS month: May, June, Aug.**
Is global warming making hurricanes more intense?

Profile: Tyler Curiel (www.pbs.org/nova/sciencenow/3302/08.html) **YOS month: December**
In the midst of Hurricane Katrina, a cancer researcher risks everything to save a medical treasure.

Episode 6, October 2006

Asteroid (www.pbs.org/nova/sciencenow/3313/01.html) YOS month: **March, July**

Will a doomsday rock the size of the Rose Bowl hit Earth in 2036?

Related Topics: Meteorites, Lunar Science, Planetary Science, Geology, Engineering, Space Policy, NASA, Planetary Defense, Social Psychology, Geophysics, Geomorphology, Environmental Archaeology, Oceanography, Geochemistry, Paleontology, Apophis, Space Debris, Shooting Stars, Crater, Demise of Dinosaurs

Island of Stability (www.pbs.org/nova/sciencenow/3313/02.html) YOS month: **March, November**

Follow the decades-long quest to create the elusive element 114.

Related Topics: Nobel Gas, Metal, Periodic Table of Elements, Nuclear Chemistry, Atomic Number, Discovery Experiments

Obesity (www.pbs.org/nova/sciencenow/3313/03.html) YOS month: **February, December**

Examine the biology behind the compulsion to eat.

Related Topics: Genetics, Diet, Exercise, Metabolism, Environment, Behavior, Pediatrics, Disease Control and Prevention, Bioethics, Medical Sociology, Brain Chemistry, Heredity, Eating Behavior, Hunger Drive, Fat Hormone (Lepton)

Profile: Karl Iagnemma (www.pbs.org/nova/sciencenow/3313/04.html) YOS month: **March, July**

An innovative MIT roboticist is also an acclaimed fiction writer.

Related Topics: Mechanical Engineering, Physics

Episode 7, November 2006

Mass Extinction (www.pbs.org/nova/sciencenow/3318/01.html) YOS month: **May, June, August, September, October, November**

What caused the mother of all extinctions 250 million years ago?

Related Topics: Undersea Volcanic Activity, Greenhouse Gases, Marine Ecology, Geology, Ocean Sciences, Geochemistry, Marine Biology, Oxygen Starved Oceans, Carbon Dioxide, Ocean Chemistry, Hydrogen Sulfide, Permian Extinction

1918 Flu (www.pbs.org/nova/sciencenow/3318/02.html) YOS month: **February, December**

A virus that killed up to 50 million people is brought back to life to decipher its deadliness.

Related Topics: Infectious Diseases, Epidemiology, Biochemistry, Genetics, Virology, Microbiology, Immunology, Statistics, Avian Flu, Mutations, Vaccines, Pathology, Reverse Genetics, Virus

Papyrus (www.pbs.org/nova/sciencenow/3318/04.html) YOS month: **March**

Scraps of writings from a garbage dump in ancient Egypt reveal what life was like 2,000 years ago.

Related Topics: Rare Books, Archimedes Codex, Classics, Antiquity, Multispectral Imaging

Profile: Cynthia Breazeal (www.pbs.org/nova/sciencenow/3318/03.html) YOS month: **March**

A daring engineer designs robots to communicate and interact the way people do.

Related Topics: Media Arts and Sciences, Robotic Life, Exchange Between Humans and Humanoid Robots, Social Skills and Interaction, Sociable Robot

Episode 8, January 2007

Aging (www.pbs.org/nova/sciencenow/3401/01.html) **YOS month: February, May, December**
Will research into "longevity genes" help us live longer and healthier lives?

Related Topics: Molecular Genetics, Cellular Biology, Insulin, Cardiology, Biogerontology, Longevity, Wine Compound, Biology, Health Economy, Demography, Pathology, Nutrition, Nematode Worms, Good Cholesterol (HDL), Longevity Genes (Situins)

Space Elevator (www.pbs.org/nova/sciencenow/3401/02.html) **YOS month: March, July, November**
Can we build a 22,000-mile-high cable to transport cargo and people into space?

Related Topics: Carbon Nanotubes and Fibers, Nanotechnology, Chemistry, Engineering

Maya (www.pbs.org/nova/sciencenow/3401/03.html) **YOS month: July, October**
NASA archeologists use satellites to pinpoint ancient ruins buried deep in the jungle.

Related Topics: Archeology, Satellite Imaging Technology, Remote-Sensing, Chemical Signatures, NASA

Profile: Bonnie Bassler (www.pbs.org/nova/sciencenow/3401/04.html) **YOS month: February, September, December**

Her insight into how bacteria "talk" has launched a revolution in biological and medical research.
Related Topics: Molecular Biology, Chemical Language, Quorum Sensing, Cellular Behavior

Episode 9, July 10, 2007

Sleep (www.pbs.org/nova/sciencenow/3410/01.html) **YOS month: February, December**
Why do we need sleep? Part of the answer may be to strengthen memories.

Related Topics: Neurology, Psychology, REM Sleep, Neuroscience, Brain Functions, Biology, Memory, Neuroimaging, Fruit Flies, Learning, Patterned Brain Activity, Hippocampus

CERN (www.pbs.org/nova/sciencenow/3410/02.html) **YOS month: March, July, November**
Beneath the Alps, the mother of all particle accelerators nears completion.

Related Topics: Black Hole, Nuclear Physics, Particle Collection, Large Hadron Collider, Particle Cosmology, Energy, Subatomic Particles, The Standard Model, High Energy Physics

Emergence (www.pbs.org/nova/sciencenow/3410/03.html) **YOS month: February, July, September, November**

How does the "intelligence" of an ant colony or the stock market arise out of the simple actions of its members?

Related Topics: Molecular Biology, Origins of Life, Astronomy, Astrophysics, Artificial Life, Microbiology, Plant Biology, Evolutionary Biology, Natural Laws, Emergent Complexity, Crowd Dynamics

Profile: Julie Schablitsky (www.pbs.org/nova/sciencenow/3410/04.html) **YOS month: September**
Meet an archeologist who is helping to rewrite the history of the Old West.

Related Topics: Historic Archaeology, Genetic Archaeology, Cultural History, Old West, 19th Century America, Donner Party Artifacts, Forensic Bone Analysis

Episode 10, July 24, 2007

T. Rex Blood? (www.pbs.org/nova/sciencenow/3411/01.html) **YOS month: February, September**
Preserved soft tissue, including possible blood vessels and red blood cells, are turning up in dinosaur fossils.

Related Topics: Molecular Genetics, Extinction, Genetic Codes, Paleontology, Protein, Collagen, Antibiotics, Genomes, Minerals, Chemical Changes, Paleobiology, Red Blood Cells, Cloning

Epigenetics (www.pbs.org/nova/sciencenow/3411/02.html) **YOS month: February, September, Dec.**
Our lifestyles and environment can change the way our genes are expressed, leading even identical twins to become distinct as they age.

Related Topics: Genetics, Environmental Influences, Nature Vs. Nurture, Psychology, Pathology, Molecular Genetics, Cytogenetics, DNA, DNA Mutations, Behavioral Genetics, Epidemiology, Identical Genes, Abnormal Genes, Epigenetic Therapy

Kryptos (www.pbs.org/nova/sciencenow/3411/03.html)
A coded sculpture at CIA headquarters has yet to be fully broken.

Related Topics: Cryptography, Computer Science, Concealment, Puzzles, History

Profile: Arlie Petters (www.pbs.org/nova/sciencenow/3411/04.html) **YOS month: March, July**
A boy from a rural village in Belize grows up to become a world-class mathematician and cosmologist.

Related Topics: Light, Physics, Mathematics, Gravitational Lensing, Patterns, Cosmology

Episode 11, June 25, 2008

Dark Matter (www.pbs.org/nova/sciencenow/0301/01.html) **YOS month: March, July**
Turns out most of the universe is held together by a mysterious, invisible substance.

Related Topics: Dark Matter and Energy, Astrophysics, Gravitation, Axion, WIMPs (Weakly Interacting Massive Particles), X-Ray Astronomy, Theoretical Physics, Astronomy, Cosmology

Of Mice and Memory (www.pbs.org/nova/sciencenow/0301/02.html) **YOS month: December**
Mice placed in enriched environments can recover lost memories, giving hope to those who study Alzheimer's.

Related Topics: Dementia, Environmental and Cognitive Enrichment, Brain Exercises, Speech-Language Pathology, Behavioral Endocrinology, Neuroscience, Brain and Cognitive Sciences, Physiology

Profile: Hany Farid (www.pbs.org/nova/sciencenow/0301/03.html) **YOS month: March**
This self-proclaimed "accidental scientist" is a digital detective inventing new ways to tell if photos have been faked.

Related Topics: Computer Science, Security Technology, Digital Forensics

Wisdom of the Crowd (www.pbs.org/nova/sciencenow/0301/04.html)
Ask enough people to estimate something, and their combined guesses will get you surprisingly close to the right answer.

Related Topics: Prediction Markets, Iowa Electronic Market, Social Theory, Prediction Traders, Business, Economics, Politics, Accounting, Marketing, Social Science

Episode 12, July 2, 2008

Personal DNA Testing (www.pbs.org/nova/sciencenow/0302/01.html) **YOS month: February, Dec.**
Genetic testing to assess risk factors for a handful of serious illnesses is now commercially available. But is it a good idea?

Related Topics: Genetics, Molecular Genetics, Genetic Counseling, Bioethics, DNA Scan, Navigenics, DNA sequence variation, Genetic Basis for Alzheimer's, Medical Genetics, Neurology, Epidemiology, Social Research, Behavioral Research, Law, Cell Biology, Biostatistics

Art Authentication (www.pbs.org/nova/sciencenow/0302/02.html) **YOS month: March**
See how clever computer algorithms can distinguish a master fake from a masterpiece.

Related Topics: Digital Conservation, Conservation, Forensic Science, Computer Science

Capturing Carbon (www.pbs.org/nova/sciencenow/0302/03.html) **YOS month: May, August, Nov.**
An eighth-grader's science fair project prompts her scientist father to develop a new way to pull excess carbon dioxide out of the atmosphere.

Related Topics: Global Warming, Carbon Capture and Sequestration (CCS), Clean Coal, Renewable Energy, Economics, Geo-Engineering, Earth Sciences, Climatology, Climate Change, Environmental Engineering, Geology, Physics, Synthetic Tree

Profile: Pardis Sabeti (www.pbs.org/nova/sciencenow/0302/04.html) **YOS month: February, Sept.**
By night she's a rocker. By day, she's a Harvard geneticist tracking the evolution of the human genome.

Related Topics: Natural Selection, Infectious Disease, Malaria, Genetics

Episode 13, July 9, 2008

Saving Hubble (www.pbs.org/nova/sciencenow/0303/01.html) **YOS month: March, July**
Two teams of spacewalkers take on the risky mission of reviving the ailing Space Telescope.

Related Topics: Hubble Space Telescope, Advanced Camera Survey (ACS), NASA, Astronomy, Civil Space Programs, Astrophysics, Engineering

First Primate (www.pbs.org/nova/sciencenow/0303/02.html) **YOS month: February, September**
Our most distant primate ancestors, which took the stage shortly after the dinosaurs left it, were tree-dwellers the size of mice.

Related Topics: Paleontology, Fossils, Anthropology, Anatomical Science, Vertebrate Zoology

Profile: Alfredo Quiñones-Hinojosa (www.pbs.org/nova/sciencenow/0303/03.html) **YOS: Dec.**
He jumped the fence from Mexico to work as a farmhand and ended up a leading brain surgeon.

Related Topics: Neurology, Brain Surgery, Neuro-Stem Cells

Killer Microbe (www.pbs.org/nova/sciencenow/0303/04.html) **YOS month: February, December**
A relatively benign bug becomes a highly lethal pathogen, known to U.S. soldiers as Iraqibacter.

Related Topics: Iraq Bacteria, Baumannii, Drug Resistant Bacteria, Infectious Diseases, Infection Control, Epidemiology, Disease Surveillance

Episode 14, July 16, 2008

Bird Brains (www.pbs.org/nova/sciencenow/0304/01.html) **YOS month: February, September**
Clues to the origins of human language are turning up in the brains of birds.

Related Topics: Vocal Learning Behavior, Stuttering, Language Gene (FOXP2), Biological Science, Psychology, Neurobiology, Brain Development, Zebra Finches

Space Storms (www.pbs.org/nova/sciencenow/0304/02.html) **YOS: March, July, October, November**
Behind the dazzling display of the aurora borealis are space storms that could turn the lights off here on Earth.

Related Topics: Northern Lights, THEMIS, Sunspot Cycle, Solar Wind, Satellite Navigation, Solar Physics, Atmospheric and Oceanic Sciences, Earth and Space Sciences, Computer Science, Astrophysics, Astronomy, Electrical Engineering,

Profile: Yoky Matsuoka (www.pbs.org/nova/sciencenow/0304/03.html) **YOS month: March, Dec.**
A former tennis prodigy aims to create advanced prosthetic limbs controlled by human thought.

Related Topics: Neurobotics, Robotics

Smart Bridges (www.pbs.org/nova/sciencenow/0304/04.html) **YOS month: March**
Can we engineer bridges that tell us what's wrong with them before it's too late?

Related Topics: Structural Engineering, Carbon Nanotubes, Mechanical Engineering, Civil and Environmental Engineering, Strain Gauges, Sonar, Piezoelectric Sensors,

Episode 15, July 23, 2008

Leeches (www.pbs.org/nova/sciencenow/0305/01.html) **YOS month: September, December**
A century after falling out of favor among doctors, medicinal leeches are back in hospitals, sucking away on patients' wounds.

Related Topics: Animals in Medicine, Anticoagulation, Animal Assisted Therapy, Surgery, Rehabilitation Services, Body Repair

The Search for ET (www.pbs.org/nova/sciencenow/0305/02.html) **YOS month: March, July**
Astronomers have their radio telescopes tuned to receive signals from alien worlds. But is anybody out there?

Related Topics: Search for Extraterrestrial Intelligence (SETI), Electromagnetic Spectrum, Space Exploration, Allen Telescope Array, Extrasolar Planet Research, Astrobiology, Planetary Theory, Astronomy, Astrophysics, Radio Astronomy

Stem Cells Breakthrough (www.pbs.org/nova/sciencenow/0305/03.html) **YOS month: December**
Three separate teams overcome a biomedical hurdle—creating stem cells without the use of human embryos.

Related Topics: Skin Cells, Cell Reprogramming, Induced Pluripotent Stem Cells, Cancer Research, Developmental Biology, Immunology, Hematology, Ethics, Neonatology, Internal Medicine

Profile: Edith Widder (www.pbs.org/nova/sciencenow/0305/04.html) **YOS month: June, September**
Meet a marine biologist and explorer who has engineered new ways to spy on deep-sea creatures.

Related Topics: Bioluminescence, Oceanic Research, Technology, Biology, Genetics

Episode 16, July 30, 2008

Phoenix Mars Lander (www.pbs.org/nova/sciencenow/0306/01.html) YOS month: **March, June, July,**

September, October, November

NASA's latest robot has already found frozen water and is looking for more signs that the Red Planet could support life.

Related Topics: Mars, Polar Regions, Soil Composition, Extraterrestrial Life, Microbes, Engineering, NASA, Geology, Astrobiology, Planetary Science

Brain Trauma (www.pbs.org/nova/sciencenow/0306/02.html) YOS month: **December**

Even so-called "mild" head injuries turn out to be anything but.

Related Topics: Concussion, Grey Matter, White Matter, Diffusion Tensor Imaging, Eye Tracking, Neuropsychology, Neuroscience, Psychology, Clinical Optometry, Cognitive Medicine, Rehabilitation

Mammoth Mystery (www.pbs.org/nova/sciencenow/0306/03.html) YOS month: **September, Nov.**

A pair of mammoth skeletons is found locked together by their tusks. What happened?

Related Topics: Nebraska Grasslands, Tusks, Chemical Records, Biology, Geological Science, Ecology, Evolutionary Biology, Vertebrate Paleontology, Archaeology, Museum Collections

Profile: Judah Folkman (www.pbs.org/nova/sciencenow/0306/04.html) YOS month: **December**

Once scorned for his ideas about how cancer grows, the late Judah Folkman is now hailed as a visionary.

Related Topics: Cancer, Vision, Angiogenesis, Tumor Secretion, VegF (Angiogenesis Proteins), Angiogenesis Inhibitors, Vascular Biology, Blood-Vessel Cells, Cell Biology

Look for new episodes broadcasting in the summer of 2009