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Episode 1, January 2005

Mirror Neurons  (pbs.org/nova/sciencenow/3204/01.html)
A recently discovered system in the brain may help explain why we humans can get so worked up watching other people.

Hurricanes  (pbs.org/nova/sciencenow/3204/02.html)
Predicting a hurricane's intensity is notoriously difficult, but new tools may make it easier.

Profile: James McLurkin  (pbs.org/nova/sciencenow/3204/03.html)
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  (pbs.org/nova/sciencenow/3204/04.html)
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  (pbs.org/nova/sciencenow/3209/01.html)
The remains of three-foot-tall humans are discovered on a remote Indonesian island.

T. Rex  (pbs.org/nova/sciencenow/3209/02.html)
An astonishing adolescent growth spurt accounts for T. rex's enormous size.

Profile: Naomi Halas  (pbs.org/nova/sciencenow/3209/03.html)
Naomi Halas is a pioneering nanotechnologist bent on seeing practical applications for her work—and soon.

Stem Cells  (pbs.org/nova/sciencenow/3209/04.html)
What are they, and how do we find a balance between hope for cures and respect for life?

Frozen Frogs  (pbs.org/nova/sciencenow/3209/05.html)
The common wood frog freezes solid every winter and then, come spring, defrosts and mates.

Episode 3, July 2005

Fuel Cells  (pbs.org/nova/sciencenow/3210/01.html)
Hydrogen fuel cell cars promise pollution-free driving, but will we see them anytime soon?

RNAi  (pbs.org/nova/sciencenow/3210/02.html)
A wayward petunia leads to the discovery of modest little molecules with enormous medical promise.

Fastest Glacier  (pbs.org/nova/sciencenow/3210/03.html)
A glacier moving way too fast reveals how unpredictable the effects of global warming can be.

Profile: Brothers Chudnovsky  (pbs.org/nova/sciencenow/3210/04.html)
The story of two brilliant mathematicians, a unicorn, and a homemade supercomputer.
Episode 4, October 2005

**Artificial Life** (pbs.org/nova/sciencenow/3214/01.html)
Are scientists on the verge of making living things from little more than dust?

**Lightning** (pbs.org/nova/sciencenow/3214/02.html)
Experts still aren’t sure what triggers it, but they suspect cosmic rays from outer space.

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

**Fish Surgery** (pbs.org/nova/sciencenow/3214/04.html)
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** (pbs.org/nova/sciencenow/3214/05.html)
Neil deGrasse Tyson has a bone to pick with Hollywood aliens.

**Hurricane Katrina** (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** (pbs.org/nova/sciencenow/3302/01.html)
A stunning discovery at the far reaches of our solar system raises questions about what makes a planet a planet.

**Twin Prime Conjecture** (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** (pbs.org/nova/sciencenow/3302/03.html)
An enchanting bird believed extinct mysteriously reappears ... maybe.

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

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

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

**Stronger Hurricanes** (pbs.org/nova/sciencenow/3302/07.html)
Is global warming making hurricanes more intense?

**Profile: Tyler Curiel** (pbs.org/nova/sciencenow/3302/08.html)
In the midst of Hurricane Katrina, a cancer researcher risks everything to save a medical treasure.
Episode 6, October 2006

**Asteroid**  (pbs.org/nova/sciencenow/3313/01.html)
Will a doomsday rock the size of the Rose Bowl hit Earth in 2036?


**Island of Stability**  (pbs.org/nova/sciencenow/3313/02.html)
Follow the decades-long quest to create the elusive element 114.

*Keywords and Phrases: Nobel Gas, Metal, Periodic Table of Elements, Nuclear Chemistry, Atomic Number, Discovery Experiments*

**Obesity**  (pbs.org/nova/sciencenow/3313/03.html)
Examine the biology behind the compulsion to eat.

*Keywords and Phrases: 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**  (pbs.org/nova/sciencenow/3313/04.html)
An innovative MIT roboticist is also an acclaimed fiction writer.

*Keywords and Phrases: Mechanical Engineering, Physics*

Episode 7, November 2006

**Mass Extinction**  (pbs.org/nova/sciencenow/3318/01.html)
What caused the mother of all extinctions 250 million years ago?

*Keywords and Phrases: 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**  (pbs.org/nova/sciencenow/3318/02.html)
A virus that killed up to 50 million people is brought back to life to decipher its deadliness.

*Keywords and Phrases: Infectious Diseases, Epidemiology, Biochemistry, Genetics, Virology, Microbiology, Immunology, Statistics, Avian Flu, Mutations, Vaccines, Pathology, Reverse Genetics, Virus*

**Papyrus**  (pbs.org/nova/sciencenow/3318/04.html)
Scraps of writings from a garbage dump in ancient Egypt reveal what life was like 2,000 years ago.

*Keywords and Phrases: Rare Books, Archimedes Codex, Classics, Antiquity, Multispectral Imaging*

**Profile: Cynthia Breazeal**  (pbs.org/nova/sciencenow/3318/03.html)
A daring engineer designs robots to communicate and interact the way people do.

*Keywords and Phrases: Media Arts and Sciences, Robotic Life, Exchange Between Humans and Humanoid Robots, Social Skills and Interaction, Sociable Robot*
Episode 8, January 2007

**Aging** (pbs.org/nova/sciencenow/3401/01.html)
Will research into "longevity genes" help us live longer and healthier lives?

*Keywords and Phrases: 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** (pbs.org/nova/sciencenow/3401/02.html)
Can we build a 22,000-mile-high cable to transport cargo and people into space?

*Keywords and Phrases: Carbon Nanotubes and Fibers, Nanotechnology, Chemistry, Engineering*

**Maya** (pbs.org/nova/sciencenow/3401/03.html)
NASA archeologists use satellites to pinpoint ancient ruins buried deep in the jungle.

*Keywords and Phrases: Archeology, Satellite Imaging Technology, Remote-Sensing, Chemical Signatures, NASA*

**Profile: Bonnie Bassler** (pbs.org/nova/sciencenow/3401/04.html)
Her insight into how bacteria "talk" has launched a revolution in biological and medical research.

*Keywords and Phrases: Molecular Biology, Chemical Language, Quorum Sensing, Cellular Behavior*

Episode 9, July 10, 2007

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

*Keywords and Phrases: Neurology, Psychology, REM Sleep, Neuroscience, Brain Functions, Biology, Memory, Neuroimaging, Fruit Flies, Learning, Patterned Brain Activity, Hippocampus*

**CERN** (pbs.org/nova/sciencenow/3410/02.html)
Beneath the Alps, the mother of all particle accelerators nears completion.

*Keywords and Phrases: Black Hole, Nuclear Physics, Particle Collection, Large Hadron Collider, Particle Cosmology, Energy, Subatomic Particles, The Standard Model, High Energy Physics*

**Emergence** (pbs.org/nova/sciencenow/3410/03.html)
How does the "intelligence" of an ant colony or the stock market arise out of the simple actions of its members?

*Keywords and Phrases: Molecular Biology, Origins of Life, Astronomy, Astrophysics, Artificial Life, Microbiology, Plant Biology, Evolutionary Biology, Natural Laws, Emergent Complexity, Crowd Dynamics*

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

*Keywords and Phrases: 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?** ([pbs.org/nova/sciencenow/3411/01.html](http://pbs.org/nova/sciencenow/3411/01.html))
Preserved soft tissue, including possible blood vessels and red blood cells, are turning up in dinosaur fossils.

*Keywords and Phrases:* Molecular Genetics, Extinction, Genetic Codes, Paleontology, Protein, Collagen, Antibiotics, Genomes, Minerals, Chemical Changes, Paleobiology, Red Blood Cells, Cloning

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

*Keywords and Phrases:* Genetics, Environmental Influences, Nature Vs. Nurture, Psychology, Pathology, Molecular Genetics, Cytogenetics, DNA, DNA Mutations, Behavioral Genetics, Epidemiology, Identical Genes, Abnormal Genes, Epigenetic Therapy

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

*Keywords and Phrases:* Cryptography, Computer Science, Concealment, Puzzles, History

**Profile: Arlie Petters** ([pbs.org/nova/sciencenow/3411/04.html](http://pbs.org/nova/sciencenow/3411/04.html))
A boy from a rural village in Belize grows up to become a world-class mathematician and cosmologist.

*Keywords and Phrases:* Light, Physics, Mathematics, Gravitational Lensing, Patterns, Cosmology

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Episode 11, June 25, 2008

**Dark Matter** ([pbs.org/nova/sciencenow/0301/01.html](http://pbs.org/nova/sciencenow/0301/01.html))
Turns out most of the universe is held together by a mysterious, invisible substance.

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

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

*Keywords and Phrases:* Dementia, Environmental and Cognitive Enrichment, Brain Exercises, Speech-Language Pathology, Behavioral Endocrinology, Neuroscience, Brain and Cognitive Sciences, Physiology

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

*Keywords and Phrases:* Computer Science, Security Technology, Digital Forensics

**Wisdom of the Crowd** ([pbs.org/nova/sciencenow/0301/04.html](http://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.

*Keywords and Phrases:* Predication Markets, Iowa Electronic Market, Social Theory, Predication Traders, Business, Economics, Politics, Accounting, Marketing, Social Science
Episode 12, July 2, 2008

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

*Keywords and Phrases: 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** (pbs.org/nova/sciencenow/0302/02.html)
See how clever computer algorithms can distinguish a master fake from a masterpiece.

*Keywords and Phrases: Digital Conservation, Conservation, Forensic Science, Computer Science*

**Capturing Carbon** (pbs.org/nova/sciencenow/0302/03.html)
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.

*Keywords and Phrases: 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** (pbs.org/nova/sciencenow/0302/04.html)
By night she’s a rocker. By day, she’s a Harvard geneticist tracking the evolution of the human genome.

*Keywords and Phrases: Natural Selection, Infectious Disease, Malaria, Genetics*

Episode 13, July 9, 2008

**Saving Hubble** (pbs.org/nova/sciencenow/0303/01.html)
Two teams of spacewalkers take on the risky mission of reviving the ailing Space Telescope.

*Keywords and Phrases: Hubble Space Telescope, Advanced Camera Survey (ACS), NASA, Astronomy, Civil Space Programs, Astrophysics, Engineering*

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

*Keywords and Phrases: Paleontology, Fossils, Anthropology, Anatomical Science, Vertebrate Zoology*

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

*Keywords and Phrases: Neurology, Brain Surgery, Neuro-Stem Cells*

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

*Keywords and Phrases: Iraq Bacteria, Baumannii, Drug Resistant Bacteria, Infectious Diseases, Infection Control, Epidemiology, Disease Surveillance*
Episode 14, July 16, 2008

**Bird Brains**  (pbs.org/nova/sciencenow/0304/01.html)
Clues to the origins of human language are turning up in the brains of birds.

*Keywords and Phrases: Vocal Learning Behavior, Stuttering, Language Gene (FOXP2), Biological Science, Psychology, Neurobiology, Brain Development, Zebra Finches*

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

*Keywords and Phrases: 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**  (pbs.org/nova/sciencenow/0304/03.html)
A former tennis prodigy aims to create advanced prosthetic limbs controlled by human thought.

*Keywords and Phrases: Neurobiotics, Robotics*

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

*Keywords and Phrases: Structural Engineering, Carbon Nanotubes, Mechanical Engineering, Civil and Environmental Engineering, Strain Gauges, Sonar, Piezoelectric Sensors,*

Episode 15, July 23, 2008

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

*Keywords and Phrases: Animals in Medicine, Anticoagulation, Animal Assisted Therapy, Surgery, Rehabilitation Services, Body Repair*

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

*Keywords and Phrases: 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**  (pbs.org/nova/sciencenow/0305/03.html)
Three separate teams overcome a biomedical hurdle—creating stem cells without the use of human embryos.

*Keywords and Phrases: Skin Cells, Cell Reprogramming, Induced Pluripotent Stem Cells, Cancer Research, Developmental Biology, Immunology, Hematology, Ethics, Neonatology, Internal Medicine*

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

*Keywords and Phrases: Bioluminescence, Oceanic Research, Technology, Biology, Genetics*
Episode 16, July 30, 2008

Phoenix Mars Lander (pbs.org/nova/sciencenow/0306/01.html)
NASA’s latest robot has already found frozen water and is looking for more signs that the Red Planet could support life.

Keywords and Phrases: Mars, Polar Regions, Soil Composition, Extraterrestrial Life, Microbes, Engineering, NASA, Geology, Astrobiology, Planetary Science

Brain Trauma (pbs.org/nova/sciencenow/0306/02.html)
Even so-called "mild" head injuries turn out to be anything but.

Keywords and Phrases: Concussion, Grey Matter, White Matter, Diffusion Tensor Imaging, Eye Tracking, Neuropsychology, Neuroscience, Psychology, Clinical Optometry, Cognitive Medicine, Rehabilitation

Mammoth Mystery (pbs.org/nova/sciencenow/0306/03.html)
A pair of mammoth skeletons is found locked together by their tusks. What happened?

Keywords and Phrases: Nebraska Grasslands, Tusks, Chemical Records, Biology, Geological Science, Ecology, Evolutionary Biology, Vertebrate Paleontology, Archaeology, Museum Collections

Profile: Judah Folkman (pbs.org/nova/sciencenow/0306/04.html)
Once scorned for his ideas about how cancer grows, the late Judah Folkman is now hailed as a visionary.

Keywords and Phrases: Cancer, Vision, Angiogenesis, Tumor Secretion, VegF (Angiogenesis Proteins), Angiogenesis Inhibitors, Vascular Biology, Blood-Vessel Cells, Cell Biology