



IOWA AND AFTER

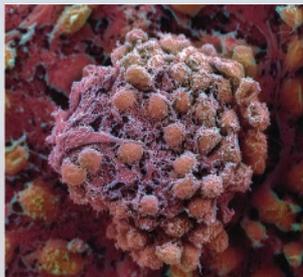
After months of manoeuvre and preliminary debate, on 3 January the Iowa caucuses mark the start of the formal process by which the US political parties will choose their presidential candidates. A host of issues are on the table, and science is not high on the list. Nevertheless some scientific issues are cropping up out on the campaign trail.

Stem cells, although still an issue, seem to have taken a back seat, even though the new president would be in a position to repeal President George W. Bush's 2001 restrictions on federal funding for research on embryonic stem-cell lines. Climate and energy receive a lot of attention, with candidates happy to talk of emissions reductions that would bite far after their terms have ended, and with some who have previously opposed corn-ethanol subsidies changing their minds when looking for votes among the Iowa cornfields. Spending on the physical sciences, other than energy, comes up rarely — although Senator Barack Obama's proposal to take funds from NASA's planned shuttle replacement has ruffled some feathers.

Nature's Eric Hand takes a look at the leading candidates' stances on some science-related issues.

See Editorial, page 1.

	HILLARY CLINTON (DEMOCRAT) SENATOR FROM NEW YORK, FORMER FIRST LADY	BARACK OBAMA (DEMOCRAT) SENATOR FROM ILLINOIS	JOHN EDWARDS (DEMOCRAT) FORMER SENATOR FROM NORTH CAROLINA	BILL RICHARDSON (DEMOCRAT) GOVERNOR OF NEW MEXICO, FORMER ENERGY SECRETARY	JOE BIDEN (DEMOCRAT) SENATOR FROM DELAWARE
CLIMATE/ENERGY	Calls for reducing emissions by 80% from 1990 levels by 2050 via a cap-and-trade system. Does not support a carbon tax but argues for standards on efficiency, mileage, and renewable energy to meet that goal. Says she is "agnostic" about nuclear power.	Calls for reducing emissions by 80% from 1990 levels by 2050 via a cap-and-trade system. Wants to invest \$150 billion over 10 years in alternative energy sources. Supports coal liquefaction, but only if it emits 20% less carbon than conventional fuels.	Calls for reducing emissions by 80% from 1990 levels by 2050 via a cap-and-trade system. Wants to push for a climate change treaty that has binding elements for all countries, including those in the developing world. Opposes nuclear power — says it's too costly to build new plants and too unsafe to dispose of waste.	Calls for reducing emissions by 90% from 1990 levels by 2050 via a cap-and-trade system. Proposes increasing mileage standards to 50 miles per gallon by 2020, and setting a renewable-energy target of 50% by 2040.	Calls for reducing emissions by 80% from 1990 levels by 2050. Wants every US car sold to be equipped with flex-fuel technology, and half of all major gas stations to offer biofuels by 2017. Supports ethanol from corn as a transitional solution for energy woes, but says it is not sustainable in the long term and pushes for cellulosic sources.
BIOMEDICAL/STEM CELLS	Supports federal funding for embryonic stem-cell research. Proposed increasing National Institutes of Health budget by 50% over five years, and doubling it over ten years.	Supports federal funding for embryonic stem-cell research.	Supports federal funding for embryonic stem-cell research.	Supports federal funding for embryonic stem-cell research. Proposed a state-funded embryonic stem-cell research centre at the University of New Mexico in Albuquerque.	Supports federal funding for embryonic stem-cell research.
SPACE	Supports human exploration of space, including completing the International Space Station and replacing the space shuttle with a new generation of launch vehicles.	Would delay NASA's Constellation programme to build new rockets and crew vehicles for five years, instead putting that money toward an \$18-billion education plan.	Supports human exploration of space, and says other countries should also be involved.	Sees space as a "bona fide area of economic growth and opportunity". Pushed for a sales tax to support the building of a spaceport in New Mexico.	Wants to make China a full partner in space exploration rather than a "frustrated new entrant" that has to catch up with the United States.
NOTABLE QUOTE	"My 5th grade teacher Mrs Kraus came into our classroom and said we had to study math and science because the President said so. I was convinced that President Eisenhower had called up Mrs Kraus and told her, 'You tell those children — and particularly that Hillary, who doesn't really like math — that her country needs her.'"	"We're not going to have the engineers and scientists to continue space exploration if we don't have kids who are able to read, write and compute."	"Colleges are the places where we ensure that America is competitive. Yet we've taken away funding for the NIH and our research universities. That's just a mistake."	"I myself have been told that I have a lot of energy. The secret is that I use renewable resources. Some days I'm solar powered. Some days I'm wind powered. And some days my critics just think I'm full of compressed air."	"For too long we have abdicated the responsibility to reduce our own emissions."





DENNIS KUCINICH
(DEMOCRAT)
REPRESENTATIVE FROM OHIO

RUDY GIULIANI
(REPUBLICAN)
FORMER MAYOR OF NEW YORK CITY

MITT ROMNEY
(REPUBLICAN)
FORMER GOVERNOR OF MASSACHUSETTS

MIKE HUCKABEE
(REPUBLICAN)
FORMER GOVERNOR OF ARKANSAS

JOHN MCCAIN
(REPUBLICAN)
SENATOR FROM ARIZONA

FRED THOMPSON
(REPUBLICAN)
TELEVISION ACTOR AND FORMER SENATOR FROM TENNESSEE

RON PAUL
(REPUBLICAN)
REPRESENTATIVE FROM TEXAS

Calls for reducing emissions by 80% from 1990 levels by 2050, potentially via a carbon tax. Proposes a Works Green Administration that would retrofit buildings with wind and solar power. Wants to halt all mining and logging on public land.

Supports expanding nuclear power and ethanol subsidies. Does not support increasing mileage standards or mandatory caps on emissions.

In 2004 launched a plan to address global warming, though at the time he questioned if it was happening. Pulled out of a New England emission plan (implemented by his successor). Favours tariff protection for the corn-ethanol industry. "We should not exchange dependence on oil from other countries for dependence on sugar cane from Brazil."

Supports expanding nuclear power and raising mileage standards. "It's a sin against future generations for me to act as if there are no future generations that should enjoy the world as I do."

Has been a leader in the Senate on global-warming legislation. Introduced a bill with Joseph Lieberman (Ind, Connecticut) to cut emissions by roughly 60% from 1990 levels by 2050. Does not support a carbon tax. Once criticized ethanol as an alternative fuel, but now supports it, citing the rising cost of oil.

Says there is no scientific consensus about the cause of global warming, but that it makes sense to take "reasonable steps" to reduce emissions without harming the economy. Voted against ethanol subsidies but now says he supports them. Voted against raising mileage standards and for drilling in the Arctic National Wildlife Refuge.

On global warming: says there are "reputable scientists on both sides of that argument". Opposes major government regulations to control emissions. Does not support a carbon tax, which he calls "simply an acknowledgement that you can pollute with government permission". Supports expanding nuclear energy. Opposes tariffs on ethanol from corn.

Supports federal funding for embryonic stem-cell research. "There are so many different things that stem-cell research can teach us."

Supports federal funding for embryonic stem-cell research from surplus embryos from fertilization clinics: "As long as we're not creating life in order to destroy it, as long as we're not having human cloning, and we limit it to that ... there is plenty of opportunity to then use federal funds in those situations where you have limitations."

Calls for a ban on creating embryos for research purposes, but does not oppose the use of surplus embryos from *in vitro* fertilization clinics. Does not support federal funding for the research.

Opposes federal funding of embryonic stem-cell research, and points to work on adult stem cells instead.

Supports embryonic stem-cell research. "I believe that we need to fund this. This is a tough issue for those of us in the pro-life community. I would remind you that these stem cells are either going to be discarded or perpetually frozen. We need to do what we can to relieve human suffering."

Opposes stem-cell research that requires the destruction of human embryos. Says that embryonic research hasn't had a breakthrough, and cites a disputed list of 73 'breakthroughs' that use adult stem cells.

Says individual states and citizens should decide whether to permit, ban or fund embryonic stem-cell research. "I strongly object to forcing those Americans who believe embryonic stem-cell research is immoral to subsidize such research with their tax dollars."

Wants NASA to focus "more on earthly projects" such as producing green energy. Says innovations will "eventually" be turned into space exploration.

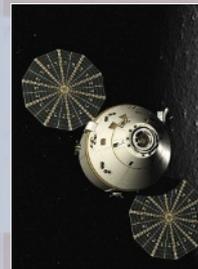
Says he will continue to aggressively support space exploration. In response to a child's question, said he would be prepared to defend against an alien attack.

Supports the space programme as a way to drive investment in technology and innovation. Says he has no reason to change Bush's plan for NASA.

Broadly supports space exploration as a trigger for technology development. "Now whether we need to send somebody to Mars, I don't know. But I'll tell you what: If we do, I've got a few suggestions, and maybe Hillary could be on the first rocket to Mars."

Showed some scepticism after Bush's initial announcement, but now calls it "not only visionary, but doable."

Has said little except...



Says he is "absolutely committed to human space exploration".

On reports that he had seen a UFO: "More people in this country have seen UFOs than I think approve of George Bush's presidency."

"Nuclear power is dangerous. So is every form of power. But no one's died from nuclear power in the United States. So our commitment here is to expand it, make sure it's safe."

"I believe that God designed the Universe and created the Universe. I believe he used the process of evolution to create the human body."

"If you want to believe that you and your family came from apes, I'll accept that."

On the push for global-warming legislation: "Inaction could be disastrous."

... "[Reports of rising temperatures on other planets have] led some people, not necessarily scientists, to wonder if Mars and Jupiter, non-signatories to the Kyoto Treaty, are actually inhabited by alien SUV-driving industrialists who run their air conditioning at 60 degrees and refuse to recycle."

"Neither party in Washington can fathom that millions and millions of Americans simply don't want their tax dollars spent on government research of any kind."



Information gathered from questionnaires sent to candidates' campaigns, from their published platforms and from media reports. Images from: K. Lamarque/Reuters; S. Wenig/AP; C. East/Reuters; A. Wong/Getty; E. Miller/Getty; K. Bleier/AFP/Getty; R. Matay/AP; J. Rinaldi/Reuters; Y. Paskova/Getty; E. Dunard/AFP/Getty; B. Pugliano/Getty; M. Carlson/AP; J. Sohm/Visions of America/Corbis; M. Stojkovic/SPL; Royalty-Free/Corbis; Lockheed Martin Corp.