researchers at NASA's Kennedy Space Center in Florida are developing new metal alloys that when damaged can repair themselves. This innovative technology called SMASH for shape memory alloy self-healing could provide improved safety margins to future spacecraft landing on a distant planet. Aircraft as well as spacecraft can be subjected to material fatigue the progressive and localized structural damage that occurs when a material is subjected to repetitive stress. This technology could be used to self-repair.
these parts earlier this year NASA's Aeronautics Research Institute awarded an 18-month $275,000 dollar funding award to continue research and development of the alloy that can self repair damaged parts using liquid assistant shape-memory metals Clara right as a materials engineer and NASA's Engineering and Technology Directorate and the principal investigator for the smash project she works in Kennedy's failure analysis laboratory where experts determined why structures break down and how to avoid future
Malfunctions as we move on, we can see a lot of application in the future. We've gotten results to show us that this is a very viable type of material that can be used to repair fatigue structures we would use it in such areas as on an aircraft where you have wings a lot of cyclic stresses and fatigue is a big problem. It is very prevalent especially in aerostructures for a spacecraft traveling far from Earth. A repair shop would not be an option. Being able to perform repairs on the spot could be the solution. The SMASH technology is a metal.
metal composite and it has an aluminum
matrix we're trying to work with
aluminum because that is a structural
material and you can use that in
aeronautics applications
aircraft what we want to do is have it
be designed thermodynamically so it has
a low melting face also within it it has
reinforcements made of shape memory
alloys now shape memory alloy here's an
alloyed that wants to retain its shape
in our case we're using the wire form
and the wires you can bend it any shape
that you want as soon as you bring it up
to a particular temperature it wants to
go back to its original shape if a crack begins in the area where smash alloys have been used the shape memory alloys wire reinforcements will stretch across the crack heating in the wires will pull the metal crack surfaces back into the original shape and the elevated temperatures also will cause low melting phase in the alloy to become liquify to fill any gaps this technology could be used for any deep space type of exploration human or non-human where you could have something detect the crack and have a non-contact heating source
come up to that area and repair the

crack we also are looking to see if we

can have some of our material exposed in

the international space station outside

of space station to see if our material

would be able to have the same repair

capabilities in space that it does here

on earth putting a technology to work in

actual aircraft or spacecraft is still a

few years away once put into use safety

margins would be improved whether on an

aircraft flying near the earth or a

spaceship traveling far from home our

team is so excited to be able to work on
this we can see a future that this could

be something that going to be applied an

application ten years down the road in

our hopes is to use that not just for

space but also to be able to give it to

commercial entities and be able to

in other applications as well