Technology & science

Categories

U.S. news

World news

Politics

Business

Sports

Entertainment

Health

Tech & science

Science

Space

Gadgets

Wireless

Games

Innovation

Travel Weather

Local news

Browse

Video **Photos**

Community

Disable Fly-out

Marketplace

Shopping via MSNBC Shopping

Credit Score \$0 at CreditReport.com

Start a business Entrepreneur.com

Homes for Sale via HomePages.com

Investments \$7 online stock trades

Career Center via Monster

Autos via MSN Autos

Future space robots may think for themselves

Scientists envision 'bots working intelligently while exploring distant worlds



Launch

INTERACTIVE

Ten great movie robots

EVE, otherwise known as the Extra-terrestrial Vegetation Evaluator, represents an intelligent probe sent to an abandoned Earth in the film "WALL-E.

By Jeremy Hsu

updated 11:13 a.m. PT, Sat., July. 5, 2008

A spaceship descends with a thunderous roar and deposits a futuristic probe before taking off again. The Extraterrestrial Vegetation Evaluator (EVE) soon activates and begins flying around, scanning the barren surface for signs of life.

Scientists today can only dream of having a robotic explorer like EVE from the Disney/Pixar film "WALL-E." But some researchers are working on autonomous spacecraft, airships and rovers that can cooperate intelligently while exploring distant worlds.

"The orbiter gives you global perspective, the aerial platform a more regional perspective, and that helps determine where to deploy ground assets in a targeted fashion," said Wolfgang Fink, a physicist at Caltech in Pasadena, California.

Story continues below |



─ INTERACTIVE



The search for extrasolar planets Find out how scientists detect worlds beyond our solar system

™ Video



pours a cold one July 3: A Japanese brewer has debuted the world's first robotic bartender, now pouring pints of beer in London MSNBC's Mika Brzezinski reports. MSNBC

Robot bartender

Space.com



Image of the Day: A Long Way Down

Most popular

Most viewed Top rated Most e-mailed

Tiny carp nibble your toes in fishy pedicure N.J. man blows up apartment spraying for bugs

Sponsored links

Barack Obama's Official Campaign Website Sign up now for invitations to Barack Obama campaign events. Join us! BarackObama.com

"2008 Diet of the Year!" Amazing Chinese Weight Loss Secret. As Seen On CNN.

NBC, CBS & Fox www.Wu-YiSource.com

Equifax Credit Watch™ Protect the power of your credit and your identity www.equifax.com

Get 10 Ringtones Enter In Cell Number and Get 10 Ringtones and 1000 Mp3's! www.FreeMusicGiveAway.com

Do You Know Your Credit

The average U.S. credit score is up to 692. See yours for \$0. www.freecreditreport.com

Resource guide



Get Your 2008 Credit Score

FIND JOBS

Search Johs



Find your next car



Find Your Dream Home



Find a business to start



\$7 trades, no fee IRAs

21/07/2008 20:07 1 of 4

Fink's vision of "tier-scalable reconnaissance" starts with an orbiting spacecraft to make a global survey for interesting scientific targets, before deciding on its own where to deploy an airship such as a dirigible. The airship could look even closer at a region to find the best landing site, and finally drop a rover or some other surface explorer. That surface explorer could then results are sufficient to the surface explorer.

1,600-year-old version of Bible goes online Is media playing fair in campaign coverage? Hurricane watch along Texas-Mexico border Most viewed on msnbc.com

surface explorer. That surface explorer could then move quickly to the target area.

A demonstration of how such a surface explorer might deploy will take place in the Mars Science Laboratory mission, slated for a 2009 launch. NASA's Sky Crane carrier will hover above the surface of Mars on retrorockets while lowering an SUV-sized rover using a winch and tether.

Some Mars missions have already demonstrated the advantage of coordinating orbiters with surface explorers. Scientists used data from three Mars orbiters to determine the landing site for NASA's Phoenix Mars Lander, and also turned orbiter <u>cameras</u> on the lander as it descended to the surface. Of the three orbiters, the Mars Reconnaissance Orbiter has even helped NASA's separate Spirit and Opportunity Rovers navigate around obstacles on the Martian surface.

However, Fink and his collaborators want to take humans out of the loop and develop robots which can decide independently when and where to go. That becomes crucial for future missions to distant



Wolfgang Fink / California Institute of

An airship hovers above busy rovers and coordinates with orbiter spacecraft in this illustration of "tier-scalable reconnaissance."

places such as the moons of Saturn or Jupiter, where a command signal from Earth can take over an hour to reach robotic explorers.

The key rests with software algorithms that help robots make command decisions on their own. Fink's group has begun testing such algorithms by using three small rovers and a <u>camera</u> that looks down on a simulated indoor landscape. The camera identifies both targets and obstacles, which allows the rovers to deploy and drive around obstacles to reach their targets — all without human intervention.

"Integration is the biggest challenge," Fink noted. "At Caltech, we are now at the point where we're implementing a test-bed outdoors to develop the software to demonstrate this in action."

The outdoors test would involve a miniature airship taking the place of the camera. Researchers from around the world would be able to give commands to the airship via Internet and watch it move and deploy the rovers on its own.





Robot invasion!
At Carnegie Mellon's
Robotics Institute,
scientists are building
bots aimed at disaster
zones, hospitals — and
alien planets.

The field tests may pave the way for using similar command software on the proposed NASA and European mission to Titan or Europa. Fink and other researchers involved with the

planning have begun discussing how such a mission might shape up by the 2017 launch date.

"A Titan mission would have the orbiter deploying a balloon, and we're already thinking about having a lander," Fink explained. "There you

2 of 4 $21/07/2008 \ 20:07$

have a three-tier mission."

The tiered approach may eventually take the form of a robot that "does its own reconnaissance, goes out and looks for anomalies, finds something interesting and makes contact with the sender," Fink said, pointing to the Imperial probe from "The Empire Strikes Back" which lands on the ice planet Hoth.

Perhaps best of all, intelligent robots could react quickly to surprises and investigate anomalies — such as a geyser on Saturn's moon Enceladus, or a landslide on Mars.

"Curiosity in itself is not present in any of our machine systems," Fink said, remarking upon WALL-E's childlike tendencies which appear to distract EVE but eventually help her mission. "That curiosity drives action."

CLICK FOR RELATED CONTENT

Chemical robots squeeze into our future Giant leap for micro-robots Japan makes robot girlfriend for lonely men

© 2007 Space.com. All rights reserved. More from Space.com.



MORE FROM SPACE



Top msnbc.com stories	NBC News highlights		
Gitmo judge bars 'coercive' evidence	Al-Qaida No. 3 gives rare interview		
Oil companies splurge on investors	Companies tap 'bloggers-in-chief'		
War crimes fugitive Karadzic arrested	He's OK after SUV crash — in diner		
FDA links salmonella to jalapeños	Ex-Miss Teen drops 110 lbs		
Texas coast put on hurricane watch	Grocery store couture		

SPONSORED LINKS

Get listed here

AARP Auto Insurance From The Hartford
Save \$385 On Auto Insurance If You're Over 49. Free Quotes Today!
AARP.TheHartford.com

Alternative To Open Back SurgeryWorld Leader of Arthroscopic Procedures for Back and Neck Conditions!

www.laserspineinstitute.com

Tips For Fixing Hair Loss

3 of 4 21/07/2008 20:07

See how I did it. Before and after pics. Men and women. 92% success. www.RestorationHair.com

Find the Brazilian Cellulite Secret Here

Reduce fat deposits, firm and tone skin without surgery. Try it Free. www.cellulitecontrol.com

Reduce and Prevent Your Wrinkles

9 of 10 say skin looks years younger. Guaranteed formula. Free trial. $\label{eq:compare} \mbox{Dermitage.com}$

Featuring Today Nightly News Dateline Meet the Press MSNBC TV Newsweek	Alerts via	E-mail	RSS &
Categories Top stories Local news U.S. World Politics Business Sports	IM	updates	feeds
Entertainment Health Tech & science Travel Weather	Mobile	Podcasts	Widaets
About us Contact Site map Jobs Terms & conditions	headlines		3

© 2008 Microsoft MSN Privacy Legal Advertise

Help

4 of 4