

Scientists will live in dome to simulate Mars

By CALEB JONES
Associated Press

HONOLULU — Six carefully selected scientists will spend the next eight months living inside a man-made dome on a remote Hawaii volcano as part of a human-behavior study that could help NASA as it draws up plans for sending astronauts on long missions to Mars.

The four men and two women were scheduled to move into their new simulated space home Thursday afternoon on Mauna Loa, settling into the vinyl-covered shelter of 1,200 square feet, or about the size of a small, two-bedroom home.

They will have no physical contact with people in the outside world and will work with a 20-minute delay in communications with their support crew, or the time it would take for an email to reach Earth from Mars.

The NASA-funded project will study the psychological difficulties associated with living in isolated and confined conditions for an extended period.

“We’re hoping to figure out how best to select individual astronauts, how to compose a crew and how to support that crew on long-duration space missions,” said principal investigator Kim Binsted, a University of Hawaii science



Ross Lockwood/University of Hawaii via AP

In this 2014 photo provided by the University of Hawaii, Lucie Poulet, right, uses a geotechnical tool while Annie Caraccio records the data during a previous study outside the domed structure that will house six researchers for eight months in an environment meant to simulate an expedition to Mars, on Mauna Loa on the Big Island of Hawaii.

professor. NASA hopes to send humans to an asteroid in the 2020s and Mars by the 2030s.

The team members on the dome project include engineers, a computer scientist, a doctoral candidate and a biomedical expert. They were selected from 700 applicants who were subjected to personality tests, background checks and extensive interviews.

“When I started, my biggest fear was that we were going to be that crew that turned out like Biosphere 2, which wasn’t a very pretty picture,” said

mission commander James Bevington, a space scientist. Biosphere 2 was a

1990s experimental greenhouse-like habitat in Arizona that became a debacle. It housed different ecosystems and a crew of four men and four women in an effort to understand what would be needed for humans to live on other planets. The participants were supposed to grow their own food and recycle their air inside the sealed glass space.

But the experiment soon spiraled out of control, with the carbon dioxide level rising dangerously and plants and animals dying. The crew members grew hungry and squabbled so badly during the two years they spent cooped up that by the time they emerged, some of them weren’t speaking to each other.

The University of Hawaii operates the dome, called Hawaii Space Exploration Analog and Simulation, or

HI-SEAS, and NASA has dedicated more than \$2 million to the various studies at the facility.

Scientists previously lived in the dome for two other long-term NASA-funded stays — one of them lasting a year, the other eight months — to study food requirements and crew cohesion.

There are a number of other Mars simulation projects around the world, but one of the chief advantages of the one in Hawaii is the rugged, Mars-like landscape, on a rocky, red plain below the summit of the world’s largest active volcano.

The dome has small sleeping quarters for each member as well as a kitchen, laboratory and bathroom. Unlike the Biosphere 2, it will be an opaque structure, not a see-through one, and it will not be airtight.

Also, the crew will eat mostly freeze-dried foods, with some canned goods and snacks brought in, including one of Hawaii’s favorites, Spam. To maintain the crew’s sense of isolation, bundles of food will be dropped off at a distance from the dome, and the team members will send out a robot to retrieve them.

The participants will not be confined to the dome but will wear spacesuits whenever they step outside for geological expeditions, mapping studies or other tasks.

They will also wear instruments around their necks that measure their moods and proximity to other team members, and will use virtual reality devices to simulate familiar and comforting surroundings and help them get through the mission.

Friday Morning

STATION	6 AM	6:30	7 AM	7:30	8 AM	8:30	9 AM	9:30	10 AM	10:30	11 AM	11:30	
FOX	11 KFFX	11 AgDay	Hot/ Cleve.	Good Day Spokane	Presidential Inauguration (L)							Crime Watch Daily (N)	
FOX	KPTV	3 Good Day Oregon at 6	Good Day Oregon	Good Day Oregon	Presidential Inauguration (L)					700 Club		The Rachael Ray Show	
CBS	19 KEPR	2 News	News	CBS This Morning (N)			Harry		The Price Is Right			Young & Restless	
CBS	KOIN	19 KOIN 6 News at 6 a.m.	CBS This Morning (N)				Let's Make a Deal		The Price Is Right			Young & Restless	
NBC	25 KNDU	6 Wake Up Northwest	Presidential Inauguration	Coverage of the Presidential Inauguration. (L)									
NBC	KGW	8 KGW News at Sunrise	Presidential Inauguration	Coverage of the Presidential Inauguration. (L)									
ABC	42 KVEW	4 GM America "The 2017 Inauguration" (L)	Presidential Inauguration (L)										
ABC	KATU	5 GM America "The 2017 Inauguration" (L)	Presidential Inauguration (L)										
PBS	31 KTNW	Stretch	W.L.Yoga	Splash and Bubbles	Presidential Inauguration							Splash and Bubbles	
OPB	59	13 Stretch	Jet Gol	Nature Cat	C.George	D.Tiger	D.Tiger	Splash and Bubbles	DinoTrain	Peg + Cat		SuperWI	Thomas

January 20, 2017

AFTERNOON

STATION	12 PM	12:30	1 PM	1:30	2 PM	2:30	3 PM	3:30	4 PM	4:30	5 PM	5:30
FOX	11 KFFX	11 Paid	Pat. Court	Divorce	Divorce	Judge Mathis	The People's Court	2 1/2 Men	Mike&M.	Last Man	Last Man	
FOX	KPTV	3 12 O'Clock News	E. Stanton	Teen News	OutSpace	Y. Icons	A.Athlete	Missing	Judge Judy	Judge Judy	5 O'Clock News	
CBS	19 KEPR	2 NameG.	Bold & B.	The Talk (N)		Let's Make a Deal	Dr. Phil		Judge Judy	Judge Judy	News	News
CBS	KOIN	19 News	Bold & B.	The Talk (N)		The Doctors	Dr. Phil		Judge Judy	Judge Judy	News	News
NBC	25 KNDU	6 To Be Announced	Days of Our Lives	Hot Bench	Hot Bench	Wendy Williams	Ellen DeGeneres (N)		Ellen DeGeneres (N)		News	NBC News
NBC	KGW	8 KGW New	Paid	Days of Our Lives	T.D. Jakes	Ellen DeGeneres (N)	KGW News		KGW News		KGW News	NBC News
ABC	42 KVEW	4 Presidential (L)	The Chew	The Doctors		The Rachael Ray Show	Minute	Minute	KATU News @ 4		News	News
ABC	KATU	5 Presidential (L)	The Chew	Harry		Afternoon Live	KATU News @ 4		KATU News @ 4		News	News
PBS	31 KTNW	Charlie Rose	Ming	Quilt Day	Stretch	Arthur	Speaks	WordGirl	Arthur	Odd Squad	Biz Kid\$	Business
OPB	59	13 Paint This	Mexican	Charlie Rose (N)	Nature Cat	Bob Build	Cat/ Hat	Jet Gol	Speaks	WordGirl	Odd Squad	Wild Kratts

EVENING

STATION	6 PM	6:30	7 PM	7:30	8 PM	8:30	9 PM	9:30	10 PM	10:30	11 PM	11:30	
FOX	11 KFFX	11 Modern Family "Pilot"	Modern Family "The Bicycle Thief"	2 Broke Girls "And the Old Bike Yarn"	2 Broke Girls "And the Big Hole"	Rosewood "Asphyxiation and Aces" (N)	Sleepy Hollow "Heads of State" (N)		FOX News First at Ten	:35 Law & Order: Criminal Intent "Passion"		:35 Anger Management	
FOX	KPTV	3 6 O'Clock News	Family Feud	Family Feud	Rosewood (N)		Sleepy Hollow "Heads of State" (N)		10 O'Clock News		11 O'Clock News	2 Broke Girls	
CBS	19 KEPR	2 Action News at 6 p.m.	Inside Edition	Big Bang "The Jiminy Conjecture"	The Simpsons "The Princess Guide"	Change and Challenge: The Inauguration of Donald Trump (N)	Hawaii Five-0 "Ka Laina Ma Ke One" (N)		Blue Bloods "The One That Got Away" (N)		Action News at 11:00 p.m.	:35 Stephen Colbert	
CBS	KOIN	19 KOIN Local 6 at 6	Evening News	Extra	Ent. Tonight	Change and Challenge (N)	Hawaii Five-0 "Ka Laina Ma Ke One" (N)		Blue Bloods "The One That Got Away" (N)		KOIN 6 News/ 11	:35 S. Colbert	
NBC	25 KNDU	6 Local News	Family Feud	Wheel of Fortune	Jeopardy!	Grimm "Oh Captain, My Captain" (N)	Emerald City "Science and Magic" (N)		Dateline NBC		Local News	:35 The Tonight Show	
NBC	KGW	8 KGW News at 6:00 p.m.	Live at 7	Inside Edition		Grimm "Oh Captain, My Captain" (N)	Emerald City "Science and Magic" (N)		Dateline NBC		KGW News	:35 Tonight at 11	
ABC	42 KVEW	4 Extra	Local News at 6:30	Entertainment Tonight	The Insider	Last Man "A House Divided" (N)	Dr. Ken "A Day in the Life" (N)		20/20 "The Inauguration of Donald J. Trump" (N)		Local News at 11 :05 Jimmy Kimmel Live		
ABC	KATU	5 KATU News at 6	Jeopardy!	Wheel of Fortune	Last Man St. (N)	Dr. Ken (N)	Shark Tank		20/20 (N)		KATU News	:35 Jimmy Kimmel	
PBS	31 KTNW		PBS NewsHour	BBC World News	Natural Health	Washington Week (N)	Charlie Rose (N)		American Masters "August Wilson: The Ground on Which I Stand"		Lower-town Line		
OPB	59	13 Travelscope	Business (N)	PBS NewsHour		Washington Week (N)	Stevens' Europe		A Place to Call Home	:40 A Place to Call Home "I Believe"		Hollywood Idols	Masterpiece Classic "Victoria: Doll 123"
STATION	PEN	6 PM	6:30	7 PM	7:30	8 PM	8:30	9 PM	9:30	10 PM	10:30	11 PM	11:30
A&E	52	The First 48 "Dead Wrong"		The First 48		Confessions "Family Affair / The Hustler" (N)		Live PD					
AMC	60	*** The Departed Leonardo DiCaprio.		*** Forrest Gump himself in extraordinary situations throughout the course of his life.		(94, Com/Dra) Tom Hanks. A simple man finds himself in extraordinary situations throughout the course of his life.		*** Saving Private Ryan (1998, War) Matt Damon, Edward Burns, Tom Hanks.					
ANPL	24	Treehouse Masters	Treehouse Masters	Treehouse Masters	Treehouse Masters	Puppy Bowl	Treehouse Masters (N)	Treehouse Masters					
CMT	43	*** Crazy, Stupid, Love.	Steve Carell.	Roseanne	Roseanne	Roseanne	Roseanne	Broken Skull Challen	Broken Skull Challen				
CNBC	72	Celebrity Apprentice	Fire Up That Chopper"	Boss "Buffets, Inc."	Undercover Boss	Undercover Boss	Undercover Boss	Undercover Boss	Undercover Boss	Undercover Boss	Undercover Boss	Undercover Boss	Undercover Boss
CNN	68	Anderson Cooper 360	CNN Tonight	CNN Tonight	CNN Tonight	CNN Tonight	CNN Tonight	Anderson Cooper 360	Anderson Cooper 360	Anderson Cooper 360	Anderson Cooper 360	Anderson Cooper 360	
DISC	51	Rush "Game Over"	Rush "Abandonment"	GoldRush "Lifeline" (N)	Gold Rush (N)	The Wheel (N)	Rush "Parker vs. Rick"						
DISN	26	Girl M. (N) Bizaard.	Underc.	Good Luck	StuckMid	*** A Cinderella Story: If the Sho...	StuckMid	StuckMid	Jessie	Jessie			
ESPN	33	NBA Basketball Golden State Warriors at Houston Rockets (L)	NBA Basketball Indiana Pacers at Los Angeles Lakers Site: Staples Center -- Los Angeles, Calif. (L)				SportsCenter	SportsCenter					
ESPN2	34	ITF Tennis Australian Open Men's and Women's Third Round Site: Melbourne Park -- Melbourne, Australia (L)											
FNC	66	TuckerCarlsonTonight	Hannity	The O'Reilly Factor	TuckerCarlsonTonight	Hannity						The O'Reilly Factor	
FOOD	61	Diners	Diners	Diners	Diners	Food (N)	Diners	Diners (N)	Diners	Diners	Diners	Diners	
FREE	32	*** Home Alone 2: Lost in New York	Macaulay Culkin.	*** Free Willy '93, Fam)	Lori Petty, Jason James Richter.							The 700 Club	
FX	65	*** XXX: State of the Union	Ice Cube.	*** The Equalizer	(14, Act) Chloë Grace Moretz, Marton Csokas, Denzel Washington.							Movie	
GOLF	88	CHAMPS Golf	Golf Cent.	PGA Golf CareerBuilder Challenge Site: PGA West Stadium Course								AsianTour Golf Singapore Open (L)	
GSN	76	Fam. Feud	Fam. Feud	Fam. Feud	Fam. Feud	Fam. Feud	Fam. Feud	MindMan	MindMan	MindMan	MindMan	MindMan	
HALL	87	Last Man	Last Man	Last Man	Last Man	Home Imp	Home Imp	Middle	Middle	Middle	Middle	G. Girls	
HGTV	62	House	House	House	House	DreamHom	DreamHom	DreamHom	DreamHom	H.Hunt (N)	House (N)	House	
HIST	50	Six "Pilot"		Transition of Power: The Presidency				The Making of Trump	"The Swagger" (N)			:05 Transition of Power: The Presidency	
LIFE	29	Bring It!		The Rap Game	Bring It! (N)			Bring It! (N)				The Rap Game	
NICK	27	H.Danger	H.Danger	*** Rufus 2	Henry Danger			Full House	Full House	Full House	Full House	Friends	
ROOT	37	NCAA Basketball MSU - Billings vs St. Martin's	NCAA Basketball Arizona State at UCLA Site: Pauley Pavilion -- Los Angeles, Calif.					Champions Tennis Classics 2016 Legends -- New Haven, Conn.				ProFootball L.A. Classic	
SPIKE	42	Cops	Cops	Cops	Cops	Cops	Cops	Cops	Cops	Cops	Cops	Cops	
SYFY	67	:55 *** Shutter Island ('09, Myst)	Mark Ruffalo, Leonardo DiCaprio.	*** Faster ('10, Act)	Dwayne Johnson.	*** Doom							
TBS	59	Seinfeld "The Fire"	Seinf. "The Raincoats"	Seinf. "The Raincoats"	Seinf. "The Opposite"	*** Horrible Bosses 2	Three working stiffs plan to kidnap and ransom the adult son of a slick investor.	*** Horrible Bosses 2 ('14, Com)	Charlie Day, Jason Bateman.				
TCM	56	*** The Saint in ...	*** Strikes Back	:45 *** The Saint ('39, Myst)	George Sanders.	:15 *** The Saint's Double Trouble ('40, Myst)	George Sanders.	*** The Saint in Palm Springs	:45 *** The Saint's ...				
TLC	49	Yes Dress	Yes Dress	Paranormal Lockdown	Paranormal Lockdown	Paranormal Lockdown	Paranormal Lockdown	Haunt "Bewitched" (N)	:05 Paranormal Lock.				
TNT	57	Castle		Castle		*** Edge of Tomorrow ('14, Sci-Fi)	Tom Cruise.	*** The Chronicles of Riddick					
UNI	21	Incluido	Noticiero	La rosa de Guadalupe	Despertar contigo	Vino el amor		El color de la pasion	Impacto	Noticie.			
USA	58	Modern	Modern	Modern	Modern	Modern	Modern	Modern	Modern	Modern	Modern	Modern	
WE	118	Boot Camp: Reali (N)	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	Marriage Boot Camp	L.A. Hair	
WGN		*** 12 Rounds ('09, Act)	John Cena.	*** 12 Rounds (2009, Action)	Aidan Gillen, Ashley Scott, John Cena.			Mother	Mother				
STZ ENC	644	*** The Golden Child	:05 *** Hang 'Em High	Clint Eastwood.	Black Sails "XVII"	Black Sails "XVIII"		:55 *** Windtalkers					
HBO	518	*** Maze Runner: The Scorch Trials	Vice News	*** Hail, Caesar!	('16, Com/Dra) Josh Brolin.	Bill Maher (N)		The Young Pope					
HBO2	520	*** P.S. I Love You	:20 *** The Wedding Singer	*** Deadpool	Ryan Reynolds.	:50 *** My Big Fat Greek Weddi...							
HBO3	521	*** The Village	:20 *** The Visit ('15, Hor)	Olivia DeJonge.	*** The Sixth Sense	:50 *** The Happening							
MAX	549	Movie	*** The Fantastic Four	:10 *** Dumb and Dumber	Jim Carrey.	*** American Pie	Chris Klein.	Movie					
SHOW	578	Movie	The Affair	*** Cinderella Man ('05, Bio)	Russell Crowe.	Boxing Shobox: The New Generation (N)							
STARZ	621	*** The Family Fang	:20 *** Money Monster ('16, Dra)	Julia Roberts.	War of the Damned	:55 Spartacus	Movie						

NIGHT OWL

STATION	12 AM	12:30	1 AM	1:30	2 AM	2:30	3 AM	3:30	4 AM	4:30	5 AM	5:30
FOX	11 KFFX	11 :05 Friends	:35 Hot In	:05 CR TV								CRTV
FOX	KPTV	3 2 Broke G.	TMZ	Dish	Queens	Raising	Celeb	Paid	Paid	CARS.TV	Paid	Paid
CBS	19 KEPR	2 S. Colbert	:35 James Corden	:35 Paid	:05 Paid	:35 Paid	:05 Paid	:35 Paid	:05 Traveler	:35 Paid	Morning Saturday (N)	
CBS	KOIN	19 S. Colbert	:35 James Corden	:35 Insider	:05 Paid	:05 Paid	OurWorld	Paid	Paid	CBS This Morning Saturday (N)		
NBC	25 KNDU	6 Tonight	:35 Seth Meyers	:35 C. Daly	:05 Today Show	Mad Money		1st Look	Fam. Feud	Paid	Today (N)	
NBC	KGW	8 Tonight	:35 Seth Meyers	:35 C. Daly	:05 Steve Harvey	Mad Money		1st Look	Paid	Paid	Paid	
ABC	42 KVEW	4 :05 Nightl.	:35 Live! Kelly (N)	:35 Middle	Paid	Paid	Ironside		77 Sunset Strip		Gom. Pyle	Gom. Pyle
ABC	KATU	5 J. Kimmel	:35 Nightl.	:05 Paid	:35 Paid	:05 Paid	:35 Paid	:35 Paid	DestinTV	Paid	Paid	Paid
PBS	31 KTNW	SongCent	T. Smiley	W.Week	CharlieR	Great Performances	American Masters		Red Green		This Old House Hour	
OPB	59	13 Masterpiece Classic	W.Week	Stevens'	Great Performances at the Met	"The Nose"		Young Stars of Ballet	Business	BBC News		

PARENTS TALK BACK

Setting boundaries with a junk-food enabler

When Lakeena King's mom would get home from work, she would snoop in the kitchen garbage. She would spy the candy wrappers or chip bags, and it was on.