

NASA In-Space Inspection Technology Workshop (ISIW 2014)

Jul 15 – 16, 2014

at JSC Gilruth Center, Houston, TX

Register at ISIW 2014 Website: <http://www.nasa.gov/offices/nesc/workshops/ISIW2014.html>

Technical Sponsor: NASA Engineering and Safety Center(NESC) – NDE TDT - Bill Prosser

Chair: Mr. George Studor, NESC NDE TDT member

JSC Facility Sponsor: NASA JSC/KA – Greg Byrne, KX Image Science and Analysis - Randy Moore

Coordination Team: Sponsors(above), JSC/Ajay Koshti, LaRC/Eric Madaras

Support Team: NESC TDT Staff; KSC/Miles Skow

Purpose: Promote inspection **technology development** for In-Space/**similar needs** through identifying mutual interests/potential points of co-operation in multi-agency, industry and academic groups.

2014 In-Space Inspection Workshop Sessions

7/15	a - Alamo East(100)	b - Alamo West(50)	c - Discovery(40)	d - Coronado(40)
1	Introduction, Challenges, Vision – Including Wayne Hale – Former Shuttle Program Manager			
2	ISS Risks/Extend Life	Spacecraft Inspection	Future Space Vehicles	Software Enhancement
Lunch Speaker – Robonaut 2 NASA Dextrous Robot in Space – Ron Diftler – NASA JSC				
3	Oil/Gas Industry	Air Force & Navy	NASA Insp Operations	SBIR/STTR Topics
4	Miniature Backscatter Xray	Fully Controllable Video scopes	3D Surface Characterization	ISS Module Wall Leak Detection & Repair
7/16	a - Alamo East(100)	b - Alamo West(50)	c - Brazos (18)	d - Coronado(40)
5	Miniature Free-Flyers - Flight Systems -	ISS External Inspection - Improvements -	Temporary Adhesion - Gecko Materials -	Triggered Inspections - Add-on Sensors -
6	Miniature Free-Flyers - Test Capabilities -	Difficult to Access Areas - new tools -	Temporary Adhesion - Electro Adhesion -	Triggered Inspections - Designed-In Sensors -
Lunch Speaker – Spatial Phase 3D Imaging - Blair Barbour – Photon-X				
7	One-on-One Sessions – Technology Developers Sign-up for 15 minute private sessions with Users - Demonstration Tables remain up to the extent practical -			
8	Forward Planning Splinter Sessions – Reports prior to Wrap-up			
Note: Rio Grande Room (Conf Rm holds 8) available to schedule small sessions – see reception desk				

- All Presentations must be Publicly Released and Telecom/Web-ex is being planned
- **Documentation showing that your presentation is cleared for public release is needed**
- Displays & Demonstration Tables in Alamo Ballroom – 32 to 36 displays (1/2 of 6' table each)
- Food: Order Lunch(Buffet) by Jul 5 – Pay at Workshop - \$30/day
- Will cover cost of continental breakfast, lunch buffet, afternoon snack, coffee, tax & gratuity.
- Registration: Free
- 2012 In-Space Inspection Workshop website (previous brochure, presentations, summary):
http://www.nasa.gov/offices/nesc/workshops/in_space_non_destructive.html

Please note that all NASA civil servants and NASA contractors are required to register their conference attendance at <https://ncts.nasa.gov/index.cfm> in addition to registering here on the In-Space Inspection web site. Some centers (e.g. JSC) have their own procedure for registering on NCTS via designated organizational representatives. The conference code is 18920-14. Failure to register at the NCTS site can result in a denial to attend the conference.

ct: George Studor at george.f.studor@nasa.gov or Carol Castle at carol.j.castle@nasa.gov

ISIW 2014 Agenda (as of July 3)

ISIW 2014 Day 1: July 15th AM - Session 1 - Introduction and Session 2 - User Needs						
SORRY, ABSOLUTELY NO OUTSIDE FOOD OR BEVERAGES ALLOWED IN THE GILRUTH CENTER						
	Start	Stop	Last	First	Organization	Topic of Talk -> Title of Presentation
Session 1	Alamo Ballroom - East End			Vision - Motivation - Organization - ISIW Plan		
1-1	8:30	8:35	Byrne	Greg	JSC/KA	Welcome/Logistics/Vision
1-2	8:35	8:45	Prosser	Bill	NASA/LaRC/NESC	NESC-TDT Intro, Interest in In-Space Inspection
1-3	8:45	9:00	Hale	Wayne	Special Aerospace Services	In Space Inspection - Shuttle Program and Mission Ops Experience
1-4	9:00	9:15	Studor	George	NASA/JSC/KX - Jacobs-LZ Tech	Workshop Overview: In-Space Inspection Needs & Technologies
Break	9:15	9:30	15 minutes		Coffee/Snacks - Schedule One-on-One Sessions, Visit Displays/Demos	
Session 2a	Alamo Ballroom - East End(100)			ISS Risks and Life Extension to 2024 and beyond		
2a-1	9:30	10:00	Christiansen	Eric	NASA/JSC/KX- Jacobs-LZ Tech	Micro-Meteoroid and Orbital Debris Risk Overview
2a-2	10:00	10:30	Dempsey	Phil	NASA/JSC/OB	Inspection Considerations from the ISS Program
2a-3	10:30	11:00	Moore	Randy	NASA/JSC/KX	ISS Inspection Capabilities and Challenges
2a-4	11:00	11:30	Rollins	Michael	JSC/KX-Jacobs	Orion Inspection Planning - Lessons Learned
Session 2b	Alamo Ballroom - West End (50)			Spacecraft Inspection and Re-entry TPS		
2b-1	9:30	10:00	Roesler	Gordon	DARPA	Inspection of GEO Spacecraft for Commercial & Military Customers
2b-2	10:00	10:30	McGuire	Jill	GSFC/SSCO	Satellite Servicing Mission - Inspection Needs
2b-3	10:30	11:00	Henshaw	Glen	NRL	Overview of NRL Advances in Orbital Inspection
2b-4	11:00	11:30	Gard	Joe	JSC/EA4	Asteroid Crewed Segment Mission
Session 2c	Discovery Room (40 persons)			Future Space Vehicles and Satellite Repair		
2c-1	9:30	10:00	Vos	Gordon	NASA/JSC/SF - Wylie Labs	Technology Needs in Human Factors and Human Systems Integration
			Holden	Kitrina	NASA/JSC/SF - Wylie Labs	Technology Needs in HF and HIS - Co-presenter - One-on-One
2c-2	10:00	10:30	Perri	Dan	NASA/JSC/DX - Mission Ops	ISS IVA Maintenance, Inspection and Repair
2c-3	10:30	11:00	Wright	Michael	NASA/JSC/DX - Robotic Ops	Lighting, Illumination and Robotic Ops Integration
2c-4	11:00	11:30	Frank	Jeremy	NASA/Ames - Roadmap Lead	Autonomous Mission Operations
Session 2d:	Coronado Room(40 persons)			Opportunities with Sensor Software Enhancement		
2d-1	9:30	10:00	Leckey	Cara	NASA/LaRC	Modeling & Simulation for Enabling In-Space NDE & Health Monitoring
2d-2	10:00	10:30	Turner	James	Texas A&M	Computational Vision Technology & TAMU's LASR Lab
2d-3/4	10:30	11:30	Nellums	Robert	Independent Consultant	Space-Based Sensor Enhancement By Signal Processing
Session 2e	Rio Grande(8) Conference Room			Available to Schedule Side Meetings and Conference Calls - Check with Reception Desk		
ISIW 2014 Day 1: July 15th PM - Session 3 - User Needs						
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Lunch	11:30	12:30	Pickup Food - Visit Demonstrations - Schedule One-on-One Sessions - Return to tables/seats for Keynote Presentation			
	12:00	12:30	Diffler	Ron	NASA/JSC/ER	Robonaut Activities on ISS
BREAK	12:30	12:45	Coffee/Snacks - Prepare for One-on-One Sessions, Visit Displays/Demos			
3a	Alamo Ballroom - East End (100)			Oil/Gas Industry Needs		
3a-1	12:45	1:15	Rogers	Jon	BP	NDT Challenges for the Oil and Gas Industry
3a-2	1:15	1:45	Kapusta	Sergio	Shell - SIEP-PTI/TP	Shell International E&P Inc
3a-3	1:45	2:15	Brower	Dave	Astrotechnology Inc.	Advanced Instrumentation and Inspection for Deepwater Oil and Gas Fields
3a-4	2:15	2:45	Robello	Samuel	Halliburton	Inspection Needs Supporting Increased Well Integrity
3b	Alamo Ballroom - West End(50)			Air Force and Navy		
3b-1	12:30	1:00	Russ	Stephan	USAF - AFRLRLX - NDE	Overview of USAF NDE R&D Activities
3b-2	1:00	1:30	Floyd	Tim	WR-ALC/GRBEB	Aging Aircraft Health Monitoring for Condition Based Maintenance
3b-3	1:30	2:00	Trepal	Nathan	NAVAIR-Tech Insertion	Inspection Needs - Fleet Readiness Center Southwest
3b-4	2:00	2:30	Lockhart	Patric	NAVSEA	Navy NDT&E Needs
3c	Discovery Room(40)			NASA Inspection Operations		
3c-1	12:30	1:00	Skow	Miles	NASA KSC/NEL40 - NDE	Contamination Control Inspections of Crewed Vehicles
3c-2	1:00	1:30	Munoz	Eric	The Spaceship Company	Spacecraft NDT Inspection Needs
3c-3a	1:30	2:00	GoForth	Monte	NASA/JSC/EV	Potential Avionics Inspection Needs
3c-3b	1:30	2:00	Grygier	Michael	NASA/JSC/ES	Structural Monitoring to Minimize Inspections
3c-4	2:00	2:30	Zoughi	Reza	Missouri S&T	Towards Real-Time and 3D Millimeter Wave Imaging for In-Space Applications
			Ghasr	Mohammad T.	Missouri S&T	
3d	Coronado Room (40)			SBIR/STTR Discussion - WEBEX Telecon Primary		
3e	Rio Grand (8 Person Conf Room)			Available to Schedule Side Meetings and Conference Calls - Check with Reception Desk		

ISIW 2014 Day 1: July 15th PM - Sessions 4 - Technologies						
BREAK	2:45	3:00			Coffee/Snacks - Schedule One-on-One Sessions, Visit Displays/Demos	
Session 1	Start	Stop	Last	First	Organization	Topic of Talk -> Title of Presentation
4a	Alamo Ballroom - East End(100)			Miniature Backscatter Xray		
4a-1	3:00	3:30	Van Liew	Seth	AS&E Technologies	Handheld Backscatter Scanner Development
4a-2	3:30	4:00	Garber	Wayne	Nucsafe	Recent Backscatter Xray improvements
4a-3	4:00	4:30	Grubsky	Victor	Physical Optics Corp	Recent Progress on 3D Backscatter X-Ray NDE
4a-4	4:30	5:00	Turner	Clark	Turner Innovations	3D Backscatter Xray
4a-5	5:00	5:30	Murali	S. Krupakar	Multiversal Technologies	Compact Inertial Electrostatic Confinement (IEC) X-Ray Source
4b	Alamo Ballroom - West End(50)			Controllable Snake-arm Inspection Systems		
4b-1	3:00	3:30	LaFleur	Frank	Olympus	Flexible Videoscopes/Borescopes-Pushing the Limits of Articulation
4b-2	3:30	4:00	Pairazaman	Carlos	Uniwest	Controllable videoscopes/sensors
4b-3	4:00	4:30	Mallion	Adam	OC Robotics	Snakearm Robots and NDI
4b-4	4:30	5:00	Baybutt	Mark	SRI	Controllable Dexterous Video Inspection Device
			Low	Tom	SRI - co-presenter	Controllable Dexterous Video Inspection Device
4b-5	5:00	5:30	Tongue	Alex	4D5P	Shape Sensing Utilizing c-OFDR
4c	Discovery Room (45)			Miniature 3D Surface Profile and Damage Characterization		
4c-1	3:00	3:30	Sallee	Brad	SPEC - Systems & Processes Eng C	Vehicle Inspection LIDAR
4c-2	3:30	4:00	Greaves	Tom	Dotproduct	Repurposing Game Technology for Real Time, Handheld 3D Data Capture
			Coss	Casey	Panoscan	
4c-3	4:00	4:30	Deremer	Steve	Capture3D	Short Range Full-field Structured Blue Light 3D Scan/Photo-G
4c-4	4:30	5:00	Turner	James	Texas A&M	TAMU's LASR Lab and Computational Vision Technology
4c-5	5:00	5:30	Hagen	Nathan	Rebellion Photonics	Hyper-spectral Imaging for Detecting and Locating Gas Leaks
4d	Coronado Room (40)			ISS Module Pressure Wall Inspection Operations Tools		
4d-1	3:00	3:30	Madaras	Eric	NASA/LaRC	ISS Leak Location System
4d-2	3:30	4:00	Koshti	Ajay	NASA/JSC/ES4	Considerations for IVA NDE Instrumentation for ISS On-Orbit NDE
4d-3	4:00	4:30	Cabral	Ed	Sonatest	User Friendly NDE Ultrasound and Phased Array
4d-4	4:30	5:00	Tang	Kevin	Cybernet	Optical Tracking for NDE Sensor Scanning
4d-5	5:00	5:30	Kessler	Seth	Metis	PZT & CNT Based SHM Systems for Impact Detection & Localization
4e	Rio Grand (8 Person Conf Room)			Available to Schedule Side Meetings and Conference Calls - Check with Reception Desk		
ISIW 2014 Day 2: Jul 16th - AM - Session 5 & 6 - Technologies						
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Session 5a - Alamo Ballroom East End (100)	Miniature Free-Flying Platforms for Inspection - Part 1 - Flight Systems					
5a-1	8:30	9:00	Hinkley	David	Aerospace Corp	Aerospace PICOSAT Capability Status 2014
5a-2	9:00	9:30	Williams	Austin	Tyvak	CubeSat Proximity Operations Demonstration Mission Enabling On-Orbit Inspection
			Tsuda	Al	Tyvak	
5a-3	9:30	10:00	Johnson	Mike	Nanoracks	NanoRacks ISS Operations
Session 5b - Alamo Ballroom -West End (50)	Robotic Inspection - Part 1 - ISS External Inspection Improvements					
5b-1	8:30	9:00	Studer	Victor	NASA/JSC/EV	External High Definition Camera
5b-2	9:00	9:30	Gonthier	Yves	CSA	Dextre-Deployable Vision System(DDVS)
5b-3	9:30	10:00	Callen	Phillip	JSC/ER	Enhanced Ground Control for ISS Robotics
Session 5c - Brazos Room (18) - Upstairs	Hand's Free Operations in Zero-G - Part 1 - Temporary Adhesion with Gecko-Materials					
5c-1	8:30	9:00	Glass	Paul	Nanogripteck	Gecko Inspired Adhesive
5c-2	9:00	9:30	Gupta	Rana	Felsuma	Think Like Geckskin
5c-3	9:30	10:00	Parness	Aaron	NASA/JPL/82-105	Gecko Like Adhesives for InSpace Inspection
Session 5d - Coronado Room (40)	Autonomy Improvements - Part 1 - Condition/Event - Triggered Inspections with Add-on Sensors					
5d-1	8:30	9:00	Trott	Aaron	Invocon	Flight Systems and Technologies for Impact Detection and Location
5d-2	9:00	9:30	Bowman	Christopher	DF & NN	Data Fusion & Neural Networks applied to C5 monitoring
5d-3	9:30	10:00	Goodman	Doug	Ridgetop Group	Smart Sensors for Distributed Event-Triggered System Health Monitoring
			Ferrio	Kyle	Ridgetop Group	
Session 5e	Rio Grand (8 Person Conf Room)			Available to Schedule Side Meetings and Conference Calls - Check with Reception Desk		
BREAK	10:30	11:00			Coffee/Snacks - Schedule One-on-One Sessions, Visit Displays/Demos	
Session 6a - Alamo Ballroom East End (100)	Miniature Free-Flying Platforms for Inspection - Part 2 - Test Capabilities					
6a-1	10:30	11:00	Benavides	Jose	NASA/AMES	SPHERES Facility Overview & Opportunities
6a-2	11:00	11:30	Saenz-Otero	Alavar	MIT Space Systems Laboratory	SPHERES-X - proposed Inspection Laboratory outside ISS
6a-3	11:30	12:00	Magruder	Darby	NASA/JSC/ER4	Remote Underwater Robotic Inspection
Session 6b - Alamo Ballroom - West End (50)	Robotic Inspection - Part 2 - Difficult to Access Areas					
6b-1	10:30	11:00	Jaskolski	Cory	Hydrotech	Enabling Monitoring and Inspection with Wireless Power and Data Hotspots Through Metal Barriers.
6b-2	11:00	11:30	Baybutt	Mark	SRI	Taurus Robot
6b-3	11:30	12:00	Quinn	Roger	Case Western Reserve Univ	Climbing robots with gecko inspired adhesive feet for inspecting ISS int
Session 6c - Brazos Room (18) - Upstairs	Hand's Free Operations in Zero-G - Part 2 - Temporary Adhesion with Electro-Adhesion					
6c-1	10:30	11:00	Aguero	Victor	SRI	Electro-adhesion R & D
6c-2	11:00	11:30	Spenko	Matt	Illinois Institute of Tech	Hybrid Electrostatic/Gecko-like Adhesives
6c-3	11:30	12:00	Ferreira	Gerhard	Justik	Electro-Adhesion Technology for Space
Session 6d - Coronado (40) - Upstairs	Autonomy Improvements - Part 2 - Triggered Inspections with Designed-In Sensors					
6d-1	10:30	11:00	Rummel	Ward	D&W Enterprises, LTD	A New NDT Tool
6d-2	11:00	11:30	Pena	Francisco	Aero-Institute - NASA/DFRC	Fiber-Optic Sensing Systems for In Space Inspection
6d-3	11:30	12:00	Djordjevic	Boro	Materials & Sensors Tech, Inc.	In-situ Versus Imbedded Sensing - How Health Monitoring effects Inspection Needs
Session 6e	Rio Grand (8 Person Conf Room)			Available to Schedule Side Meetings and Conference Calls - Check with Reception Desk		

ISIW 2014 Day 2: Jul 16th - PM - Session 7 & 8 - One-on-One & Forward Planning Sessions

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Lunch 12:00 12:30 Pickup Food - Visit Demonstrations - Schedule One-on-One Sessions - Return to tables/seats for Keynote Presentation						
Speaker	12:30	1:00	Bornman	Preston	Photon-X	Applications for Spatial Phase Imaging - Capturing and understanding the physical world digitally
Speaker	1:00	1:15	Barbour	Blair		
Speaker	1:00	1:15	Zmijewski	Christopher	SPAR-3D - lead Advisory Board	SPAR-3D Conference Overview - 2014 results and 2015 in Houston
Final Speaker	1:15	1:45	TBD			
BREAK 1:45 2:00 Coffee/Snacks - Prepare for One-on-One Sessions, Visit Displays/Demos						
Session 7	2:00	4:30	All rooms	One on One Sessions -15 minute periods - See Schedule for Sign-up at the Reception Desk		
			Ten Sessions of One-on-One Sessions - 15 minute intervals - Sign-up beforehand			27 Tables x 10 slots = 270 slots; 45 Tech Developers => ~ 6 slots/TD
Session 8	4:30	4:55	Alamo East	Feedback Session - All are welcome		
Close	4:55	5:00	Studor	George		

2014 ISIW Webex and Telecom Tie-in Instructions by Room

Alamo East: "a" sessions - Both Days -	Alamo West: "b" sessions - Both Days -	Day 1: Discovery - "c" Day 2: Brazos - "c"	Coronado: "d" sessions - Both Days -
Webex: 1. Go to: https://nasa.webex.com/nasa/j.php?MTID=mc2bd7a888f5633107091a6e3bb349fa5 2. enter your name, email 3. enter password: Inspace#2014 4. Click "Join" Telecom: Dial-in # 1-844-467-4685 Passcode # 5398949869	Webex: 1: Go to https://nasanesc.webex.com/nasanesc/j.php?MTID=m004e574f444dd780ba9413d5a94bacff 2. enter your name, email 3. enter password: techno2014! 4. Click "Join" Telecom: Dial-in # 1-844-467-4685 Passcode #: 639668	Webex: 1. Go to https://nasa.webex.com/nasa/j.php?MTID=m1a4375463b064ca2b5cfcfdaf5d5b71d 2. enter your name, email 3. enter password: inspect@123 4. Click "Join" Telecom: Dial-in #: 1-844-467-6272 Passcode #: 100295	Webex: 1. Go to https://nasanesc.webex.com/nasanesc/j.php?MTID=m5ca0b2e69c6aa1fe9250173ae7b637a9 2. enter your name, email 3. enter password: workshop! 4. Click "Join" Telecom: Dial-in #: 1-844-467-6272 Passcode #: 912592

ISIW 2014 Technology Needs used to create the agenda

***Common Goals:** Low Size, Weight & Power; Minimize On-orbit crew time to address risks; Locally Derived Information to minimize data transfer; Less than 2 years to flight; Multiple NASA Aerospace program applicability – supporting recent roadmaps, Broad use case for other than Space industries and Government Agencies; take advantage of other investments to sustain maturity/long term improvements.

Technology Area	Spaceflight Need	Characteristics*
3D Surface Imagers and Profiling	- Surface Damage - Configuration	Range: 2 in – 120 ft, Insensitive to lighting, high resolution, dynamic (frame-by-frame)
3D Penetrating Imagers	- Damage+Configuration under non-conductive & conductive	Range: 2 in – 1 foot, high resolution, low SWaP, safety and reliability,
Note: In-Space Inspection Sensors Look Through Conductive Material to Target Surface - Friday, 01 July 2011 http://www.techbriefs.com/component/content/article/10507		
Liquid and Gas Leak Sensors	- Remote detection and location of leaks to vacuum	Range: 2 in – 120 ft, high sensitivity, reliability of detection & identification
COTS NDE, Sensors, Cameras	- Out of configuration, Damage Detection & Characterization	Cost, reliability, minimum operations and integration, improved performance
Difficult to Access Areas	- Small gaps, out of reach, EVA, blind spots, noise, rel. motion	Size, mobility, location, Safety/Hazard mitigation, min crew operations.
Robotic Inspection Platforms	- Decrease blind areas & EVAs - Increase direct access to site	Cost, min operations and planning, mobility, stability, size, safety/hazards
Snake-like Inspection Scopes	- Highly controlled, min hazard - 3D ops/sensing, mapping	Cross-section size, controllability, hazards, 3D mapping & head following, location
Free-Flying Inspection Platforms	- Flexibility of sensor location - Reduce manipulator ops	SWaP, Safety/Hazards, Re-use & throw-away, autonomy, sensor modularity
Efficiency		
Temporary Adhesion	- Hands Free Crew Operations - Velcro replacement - Secure equipment, sensors - On-Off grip for robotic ops	Easy-peel replacement of glues with temporary adhesion, quick on-off grip, no or low power, compliant to surfaces, IVA then EVA(extreme environment) capability
Materials/Mfging To Enhance Inspection	- Properties enhance damage - Properties for pass-through	Doping of embedded materials Coatings and etchings of surfaces
Event-Triggered Inspection	- Reduce scheduled inspection - Enable inspection on demand	Monitor environment, structure or system to detect threshold requiring inspection
Autonomous Inspection	- Reduce human ops (flt & grd) - Reduce data transfer needs	Command and Data handling minimized for robotic platforms and sensors Information & Answers with minimum data
SBIR/STTR Requested Technologies	- Fund sources, interests and contacts outside NASA - Technologies developed or being developed by others	Solicitation wording and past contracts are relevant to InSpace Inspection Workshop TRL possibly above NASA's in some areas Future interagency cooperation potential
Miscellaneous Technologies	- Catch all – not in above list - Last minute or Inspirational	Fewer, possibly higher risk applications Ground-breaking and possibly emerging

Session 7: One-on-One Sessions (Tables): Note: Example from ISIW 2012

Organization – Subject	User Representatives	Locations - TBD
NASA/JSC/ES, LaRC - In-Space NDE/SBIR	Ajay Koshti/Eric Burke	
NASA/JSC/KX-ISS -Vehicle Ext Inspection	Michael Rollins	
NASA/JSC -Human Spaceflight Exploration Team	Joenette Stecklein	
NASA/WSTF -Pressure Vessels/Propulsion NDE	Regor Saulsberry	
NASA/JSC/ES - MOD - Internal Inspections/Vision	George Studor	
NASA/ARC -SPHERES Free-flyer Test bed	Mark Micire	
NASA/ES - Inflatable Structures	Gerrard Valle	
NASA/KSC NDE - Launch Site Inspection	Rick Russell	
BP Techology/NDE	Dave Lafferty/Dan Keck	
Shell NDE and Inspection	Sergio Kapusta	
Astrotech	Dave Brower	
DHS/DTRA/TSA	Woods/Santoro	
GE - Articulating Borescopes for Power Gen Industry	Joshua Scott	
Boeing - Aircraft Mfg/NDE	Gary Georgeson	
USAF AFRL NDE	Stephan Russ	
USCAR NDE	Leo Lev	
Iowa State NDE Education Programs	Lisa Brasche	
Olympus	Curtis Dickinson, Frank Lafleur	
The Aerospace Corp	Dave Hinkley	
GE - Inspection technologies	Rebecca Rudolph	
Northrup Grumman/Newport News	Merle Eason	
NASA Satellite Servicing Capabilities	Ben Reed/Ken Hodges	
NASA/JSC Neutral Bouyancy Lab - Inspection Trng		

Demonstration/Display Tables: Note: Example from ISIW 2012

Area	Table #	Organization	POC	What?
Alamo	1a	Iowa State Univ/NDE	Linda Brasche	ISU Academics
East End	1b	Astrotechnology Inc	Dave Brower	Mini ROV needs
	2a	NASA/Free-flying Satellite Test bed	Mark Micire	SPHERES/MiniAercam
	2b	The Aerospace Corp	David Hinkley	Working Cubesat
	3	NASA/JSC/MMOD Risk Assessment	Eric Christiansen	Damaged Samples
	4a	NASA/JSC/Imagery Analysis Team	Michael Rollins	MMOD Impact Tile Array
	4b	SRI	Ron Pelrine	Electro-Adhesion Material
	5a	Univ of Maine	Moshen Shahinpoor	Ionic Polymer Muscles
	5b	NASA JPL	Aaron Parness	Gecko Adhesive Material
	Poster	NASA WSTF NDE	Regor Saulsberry	COPV/Propulsion NDE
Alamo	6a	General Magnetic Sciences, Inc	John Menner	Mag Wave
North Side	6b	Excel Orbital Systems	Kevin McGushion	M-Wave
	7a	Walleye	Dave Holbrook	Hand-held 24 GHz
	7b	Missouri Univ of Sci & Tech	Reza Zoughi	MM Wave SAF Realtime
	8a	Picometrics	Dave Zimdars	H-held THz
	8b	Aribex	Arturo Reyes	H-held Xray
	Poster	NASA Human Spaceflight Expl Team	Jonette Stecklein	HAT Poster
	9a	Physical Optics Corporation	Victor Grubsky	Backscatter Xray
	9b	ViJay Technologies	N. Shashishekha	Image Processing/B-Xray
	10a	Nucsafe	Dan Shedlock	Backscatter Xray
	10b	AS&E	Lou Wainwright	Z Backscatter Xray
Alamo	11a	Xigen	Jasen Geng	Stereo Videoscope
West End	11b	4DSP	Pierrez Vulliez	High Speed FO Strain
North Wall	12a	DFRC High Speed Fiber Optic Strain	Patrick Chan	Real-time Shape
	12b	OC Robotics -DTRA/NASA	Rob Buckingham	Snake Inspector Prototype
Alamo	13a	OC Robotics - UK	Andy Graham	New Robotic Insp Tech
West – Right side	13b	OC Robotics - UK	Andy Graham	New Robotic Insp Tech
Alamo	14a	Minnesota Wire	Tom Kukowski	CNT Wire Production
West – Left side	14b	SRI	Ron Pelrine	Robotic Snake Tech
Alamo	15	Olympus	Curtis Dickenson	Spaceflight systems
West – by Dividers	16	Olympus	Frank LaFleur	Next Gen Endoscopes

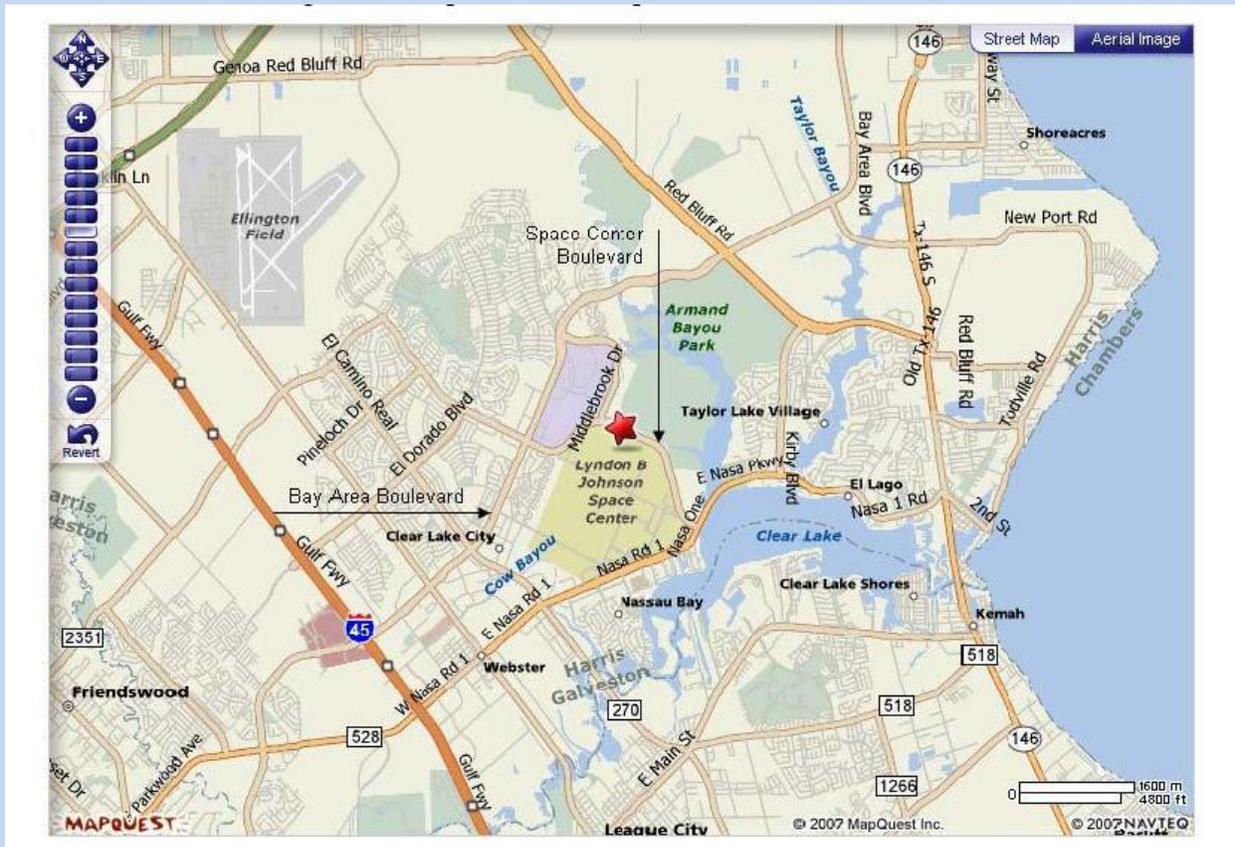
Maps and Directions: NASA Johnson Space Center, Gilruth Center

Traveling East from I-45 on Bay Area Blvd:

Turn right on Space Center Blvd., go 2.0 miles. The Gilruth Center entrance is the second entrance on the right. (Gate 5)

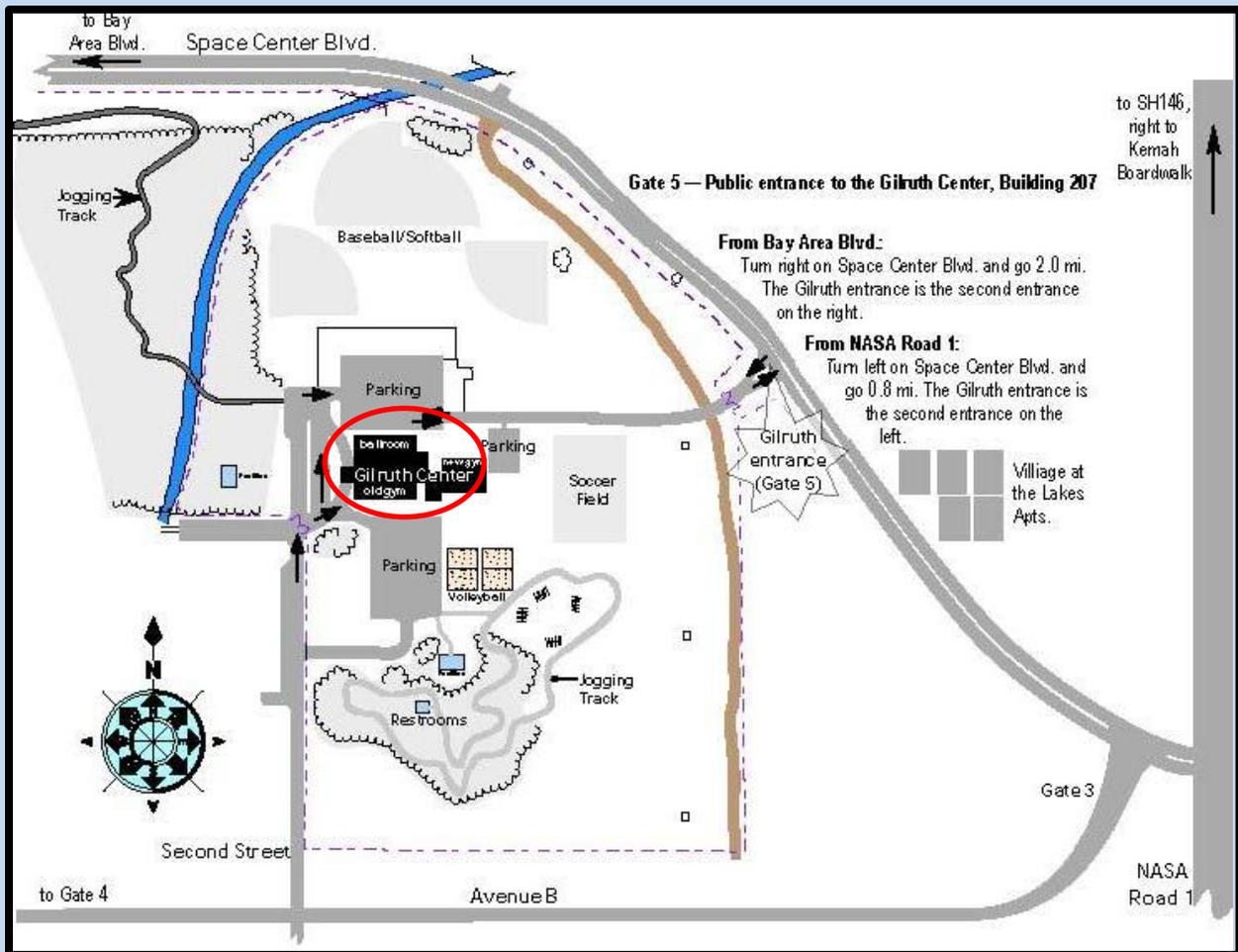
Traveling East from I-45 on NASA Road 1:

Turn left on Space Center Blvd. (the Nassau Bay Hilton will be your milestone on the right) and go 0.8 miles. The Gilruth Center entrance is the second entrance on the left (Gate5). NOTE: Do not confuse this with Gate 3, which is the first entrance on the left. Figure 1: Map of Johnson Space Center



ISIW 2014 Location: NASA Johnson Space Center

Gilruth Center – Outside the Gate – no NASA Badging Needed



Hotels Near Johnson Space Center

<https://www.google.com/maps/search/map+of+hotels+near+Johnson+space+center/@29.5474415,-95.1185466,15z>