



Quantum Communication, Sensing and Measurement in Space Workshop
June 25-29, 2012
Overview Schedule

Monday, June 25, 2012 - Hameetman Auditorium - Cahill Building

Time	Short Course	Speaker
7:30 - 8:00	Coffee and refreshments	
8:00 - 8:05	Introduction	Team Leads
8:05 - 9:20	<i>Tests of Relativistic Gravity in Space: History, Recent Progress and Future Directions</i> (includes 15 minutes for Q+A)	Slava Turyshev
9:20-9:30	Mini-break for stretching between lectures	
9:30 - 10:45	<i>Fundamentals of optical interferometry for gravitational wave detection</i> (includes 15 minute for Q+A)	Nergis Mavalvala
10:45 - 11:15	Break	
11:15 - 12:30	<i>Quantum Measurements</i> (includes 15 minutes for Q+A)	Vittorio Giovannetti
12:30 - 1:30	On site, informal lunch provided by KISS for all short course attendees	
1:30 - 2:45	<i>Fundamentals of free-space optical communication</i> (includes 15 minutes for Q+A)	Sam Dolinar
2:45	SHORT COURSE CONCLUDES	

Monday, June 25, 2012 - Third Floor - Keith Spalding Building

Time	Workshop	Speaker
2:45 - 3:30	Invitation-only workshop participants walk to Keck Institute and check in at Keith Spalding Bldg. 3rd Floor Rm 367 and enjoy refreshments	
3:30 - 4:00	Introduction to the Institute and to KISS	Michele Judd
4:00 - 5:00	Participant Introductions and Goal Setting	All
5:00 - 5:45	<i>Provocative Questions</i> for group to start thinking about	Team Leads
5:45 - 6:00	Walk to Athenaeum	
6:00 - 9:00	KISS Dinner on the Athenaeum Lawn	



Tuesday, June 26, 2012 - Keith Spalding Building - Third Floor
Theme: Measurement in Space

Time	Workshop	Speaker
8:30 - 9:00	Coffee and refreshments	
9:00 - 9:30	<i>Interferometry in Space</i> Lead in Talk (includes 10 minutes for Q+A)	Robert Spero
9:30 - 10:30	GROUP DISCUSSION: possible topics include a) scientific phenomena and signatures of interest; b) approaching quantum-limited sensitivity; c) squeezed-light in space	Moderated by: Rani Adhikari
10:30 - 11:00	Break	
11:00 - 12:00	Group discussion (breakout sessions can be formed if needed)	Moderated by: Rana Adhikari
12:00 - 12:30	Review session highlights and conclusions	All
12:30 - 2:00	KISS Lunch at the Athenaeum	
2:00 - 2:30	<i>Fundamental Science in Space</i> Lead in Talk (includes 10 minutes for Q+A)	Nan Yu
2:30 - 3:30	GROUP DISCUSSION: possible topics include a) observing quantum mechanical principles in space; b) fundamental physics tests in space; c) quantum precision measurements in the space environment (metrology, spectroscopy etc.)	Moderated by: Keith Schwab
3:30 - 4:00	Break	
4:00 - 5:00	Group discussion (breakout sessions can be formed if needed)	Moderated by: Keith Schwab
5:00 - 5:30	Review session highlights and conclusions	All
6:00 - 8:00	No-Host Dinner in Pasadena (KISS to pay for all postdocs and graduate students)	



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Wednesday, June 27, 2012 - Keith Spalding Building - Third Floor
Theme: Communication in Space

Time	Workshop	Speaker
8:30 - 9:00	Coffee and refreshments	
9:00 - 9:30	<i>Classical Communication To and From Space</i> Lead in Talk (includes 10 minutes for Q+A)	Don Boroson
9:30 - 10:15	GROUP DISCUSSION: possible topics include a) classical and quantum communication applications in space; b) approaching quantum-limits for classical information communication; c) high-energy photons in communication (e.g., X-ray)	Moderated by: Jeffrey Shapiro
10:15 - 10:45	Break	
10:45 - 11:30	Group discussion (breakout sessions can be formed if needed)	Moderated by: Jeffrey Shapiro
11:30 - Noon	Review session highlights and conclusions	All
Noon - 1:30	KISS Lunch at the Athenaeum	
1:30 - 2:00	<i>Entanglement Distribution Through Space</i> Lead in Talk (includes 10 minutes for Q+A)	Richard Hughes
2:00 - 2:45	GROUP DISCUSSION: possible topics include a) applications for entanglement distribution in space; b) entanglement-assisted communication; c) quantum communication in space (e.g., teleportation, superdense-coding)	Moderated by: Jane Nordholt
2:45 - 3:15	Break	
3:15 - 4:00	Group discussion (breakout sessions can be formed if needed)	Moderated by: Jane Nordholt
4:00 - 4:20	Review session highlights and conclusions	All
4:20 - 4:30	Workshop participants walk from Keck Institute to open technical lecture in Lees-Kubota Auditorium, Guggenheim Building	
4:30 - 5:00	Refreshments prior to lecture	
5:00 - 6:00	KISS Lecture (open to the public, targeted at Caltech, JPL and local university interested parties)	Markus Aspelmeyer
6:00 - 8:00	KISS Dinner at the Athenaeum	



Thursday, June 28, 2012 - Keith Spalding Building - Third Floor
Theme: Quantum-Limited Imaging and Sensing in Space

Time	Workshop	Speaker
8:30 - 9:00	Coffee and refreshments	
9:00 - 9:30	<i>Quantum-limited imaging and sensing in space</i> Lead in Talk (includes 10 minutes for Q+A)	Mankei Tsang
9:30 - 10:15	GROUP DISCUSSION: possible topics include a) scientific objects and phenomena of interest; b) possibilities for resolution & sensitivity improvements with quantum imaging; c) quantum-limited ranging (e.g., phase and frequency estimation)	Moderated by: Franco Wong
10:15 - 10:45	Break	
10:45 - 11:30	Group discussion (breakout sessions can be formed if needed)	Moderated by: Franco Wong
11:30 - Noon	Review session highlights and conclusions	All
12:00 - 2:00	KISS sponsored pizza lunch and student/postdoc presentations (10 minutes + 5 minutes Q+A). Will be held in the Institute.	All
2:00 - 4:00	OPEN/HOT TOPICS: revisiting/continuing discussions, lightning talks, refinement of ideas (breakout sessions can be formed if needed)	All
4:00 - 4:30	Break	
4:30 - 5:45	Informal study time to gather in small like-minded groups, or individual think time / preparation time for tomorrow's planning session	All
6:00 - 8:00	Dinner at The Athenaeum (spouses/guest invited)	



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Friday, June 29, 2012 - Keith Spalding Building - Third Floor

Time	Workshop	Speaker
8:30 - 9:00	Coffee and refreshments	
9:00 - 10:30	Identify promising avenues that have come out of the workshop	Team Leads to moderate
10:30 - 11:00	Break	
11:00 - 11:45	Final action plan for path forward and final report	Team Leads to moderate
11:45 - Noon	Logistics of checking out, and workshop slideshow	Michele Judd
12:00	Workshop concludes	