



# STANFORD CENTER FOR POSITION NAVIGATION & TIME



**NOVEMBER 17-18, 2011**      **5<sup>TH</sup> ANNUAL SYMPOSIUM**      **Kavli Auditorium at SLAC**

*The major challenges and opportunities for the next 10 years & beyond...*

## Schedule

- November 17  
All Day,  
plus Dinner at  
Huang Center
- November 18  
Morning

## Hosts

- Per Enge
- Jim Spilker
- Mark Kasevich
- Tom Langenstein
- Leo Hollberg

## Invited Speakers

- **Brad Parkinson**—Opening comments - Observations from 30,000 feet
- **Todd Walter**—The future of Satellite Navigation for Aviation
- **John Hanson**—Space Navigation using X-ray Pulsar Observations
- **Howard Zebker**—INSAR: Earth Crustal Deformation Observations from Space
- **Mark Zumberge**—Navigation of remote undersea vehicles
- **Martin Poitzsch**—Downhole Navigation for Oil & Gas Drilling
- **Tom O'Brian**—Precision time and frequency measurement/distribution for PNT+
- **Dave Bevly**—Sensor fusion for navigation in degraded environments
- **Deane Buncie**—Lightsquared Interference Issue
- **Mingquan Lu**—The current positioning performance of Compass/BeiDou
- **Gregory Beroza**—GPS/GNSS Receivers for Remote Sensing
- **Barbara Block**—Tracking Top Marine Predators Across the Blue Planet
- **David Whelan**—BTL: An Indoor-Capable Time Transfer and Geolocation System
- **Rich Fuller**—Catching Bankrobbers via GPS
- **Kenneth Kung, Tim Schempp & Deborah Lawrence**—A Decade of WAAS Lessons: How Might We Have Done It Differently?
- **Eric Gakstatter**—Using Hi-Perf L1 GPS receivers w/WAAS for mapping/surveying
- **Lu Xiaochun**—Development of BeiDou Navigation Satellite System
- **Robert Lutwak**—The SA.45s Chip-Scale Atomic Clock
- **John Prestage**—Ion-Atomic Clock for Earth Orbit and Deep Space Navigation
- **Colonel Steve Steiner**—GPS Program Update

## Sponsors

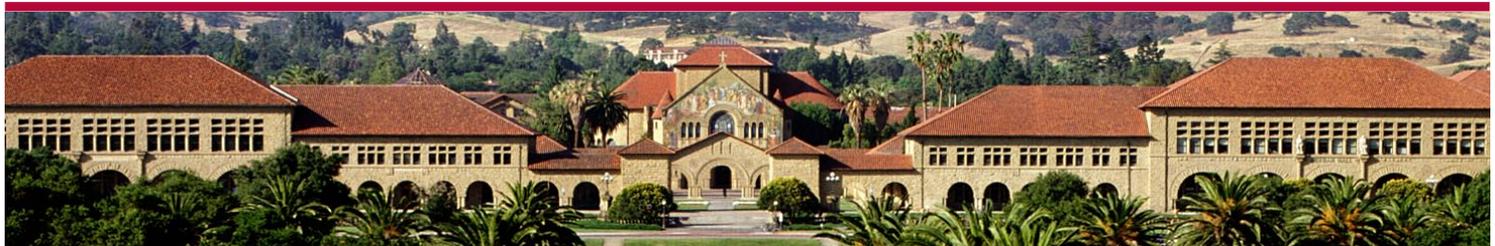


**Web Site:** <http://scpnt.stanford.edu>

**Email:** [tom.langenstein@stanford.edu](mailto:tom.langenstein@stanford.edu)

**Phone:** (650) 823-4906

**SPACE IS LIMITED to 160 Attendees! — RSVP Required**

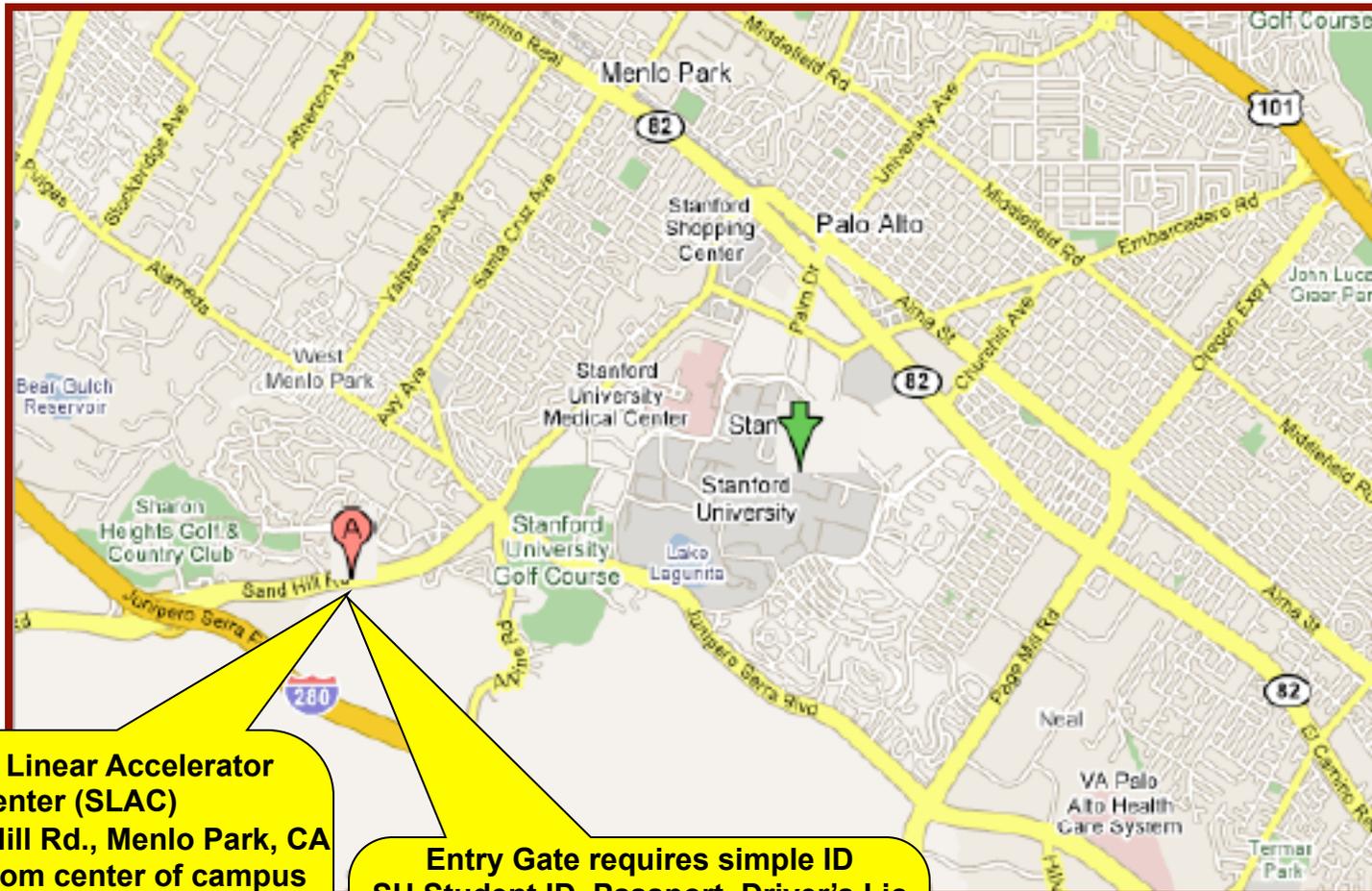


## Stanford's 2011 PNT Challenges and Opportunities Symposium - 'R12'

Day / Date	~ Start Time	~mins w/ Q&A	Invited Speaker	Affiliation	Title of Presentation
<b>Thu</b> 11/17/11	8:00am	30	<i>Reception &amp; Coffee Service at SLAC's Kavli Auditorium Lobby</i>		
<b>1</b>	8:40am	20	Parkinson, Brad	Stanford Aero Astro	Opening comments - Observations from 30,000 feet
<b>2</b>	9:00am	30	Walter, Todd	Stanford - Aero-Astro	The future of Satellite Navigation for Aviation
<b>3</b>	9:30am	30	Hanson, John	CrossTrac Engineering	Space Navigation using X-ray Pulsar Observations
	10:00am	30	<i>Morning Break</i>		
<b>4</b>	10:30am	30	Zebker, Howard	Stanford - Geophysics and EE	Earth Crustal Deformation Observations from Space using InSAR
<b>5</b>	11:00am	30	Zumberge, Mark	Scripps and UCSD	Navigation of remote undersea vehicles
<b>6</b>	11:30am	30	Poitzsch, Martin	Schlumberger	Downhole Navigation for Oil & Gas Drilling
	noon	60	<i>Catered Lunch at SLAC Cafeteria</i>		
<b>7</b>	1:00pm	30	O'Brian, Tom	NIST	Precision time and frequency measurement and distribution for PNT and other applications
<b>8</b>	1:30pm	30	Bevly, Dave	Auburn Univ.	Sensor fusion for navigation in degraded environments
<b>9</b>	2:00pm	30	Bunce, Deane	FAA	Lightsquared Interference Issue
	2:30pm	30	<i>Afternoon Break # 1</i>		
<b>10</b>	3:00pm	30	Lu, Mingquan	Tsinghua University	The current positioning performance of Compass/BeiDou
<b>11</b>	3:30pm	30	Block, Barbara	Stanford - Hopkins Marine	Sushi and Satellites: Devices for Tracking Top Marine Predators Across the Blue Planet
<b>12</b>	4:00pm	30	Beroza, Gregory	Stanford - Geophysics	Extreme Slip in the Tohoku Earthquake: What Happened and A Role for Geodesy in Assessing Hazard from Extreme Events
	4:30pm	30	<i>Afternoon Break #2</i>		
<b>13</b>	5:00pm	30	Whelan, David	Boeing	Demo - Boeing Timing and Location (BTL), An Indoor Capable Time Transfer and Geolocation System
	6:00pm	120	<i>Reception and Dinner on campus at Stanford's Huang Engineering Center's Mackenzie Room</i>		
<b>14</b>	7:30pm	30	Fuller, Rich	Broadcom	Catching Bankrobbers via GPS
<b>Fri</b> 11/18/11	8:00am	30	<i>Reception &amp; Coffee Service in SLAC's Kavli Lobby</i>		
<b>15</b>	8:30am	45	Kung, Kenneth; Schempp, Tim and Lawrence, Deborah	Raytheon; Raytheon and the FAA	One Decade of WAAS Lessons - How Would We Have Done It Differently, If Given Another Chance
<b>16</b>	9:15am	30	Gakstatter, Eric	GPS World	Using High-Performance L1 GPS receivers w/WAAS for mapping/surveying
<b>17</b>	9:45am	30	Lu, Xiaochun	National Time Service Center, Chinese Academy of Sciences	Development of BeiDou Navigation Satellite System
	10:15am	30	<i>Morning Break</i>		
<b>18</b>	10:45am	30	Lutwak, Robert	Symmetricom	The SA.45s Chip-Scale Atomic Clock
<b>19</b>	11:15am	30	Prestage, John	JPL	Next Generation Ion-Atomic Clock for Earth Orbit and Deep Space Navigation
<b>20</b>	11:45am	30	Steiner, Steve, Col.	USAF - GPS Directorate	GPS Program Update
	12:15pm	60	<i>Catered Lunch at SLAC Cafeteria</i>		

# 'PNT Challenges and Opportunities' Symposium

November 17<sup>th</sup> and 18<sup>th</sup>, 2011



**Stanford Linear Accelerator Center (SLAC)**  
2575 Sand Hill Rd., Menlo Park, CA  
~ 2 miles from center of campus

-

37 degrees 25'12.28" N  
122 degrees 12'18.54" W

-

From Hwy 280  
take Sand Hill Rd east ~ 1/2 mile

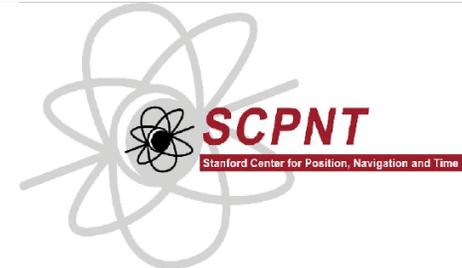
**Entry Gate requires simple ID**  
SU Student ID, Passport, Driver's Lic

-

**Free Parking Available**

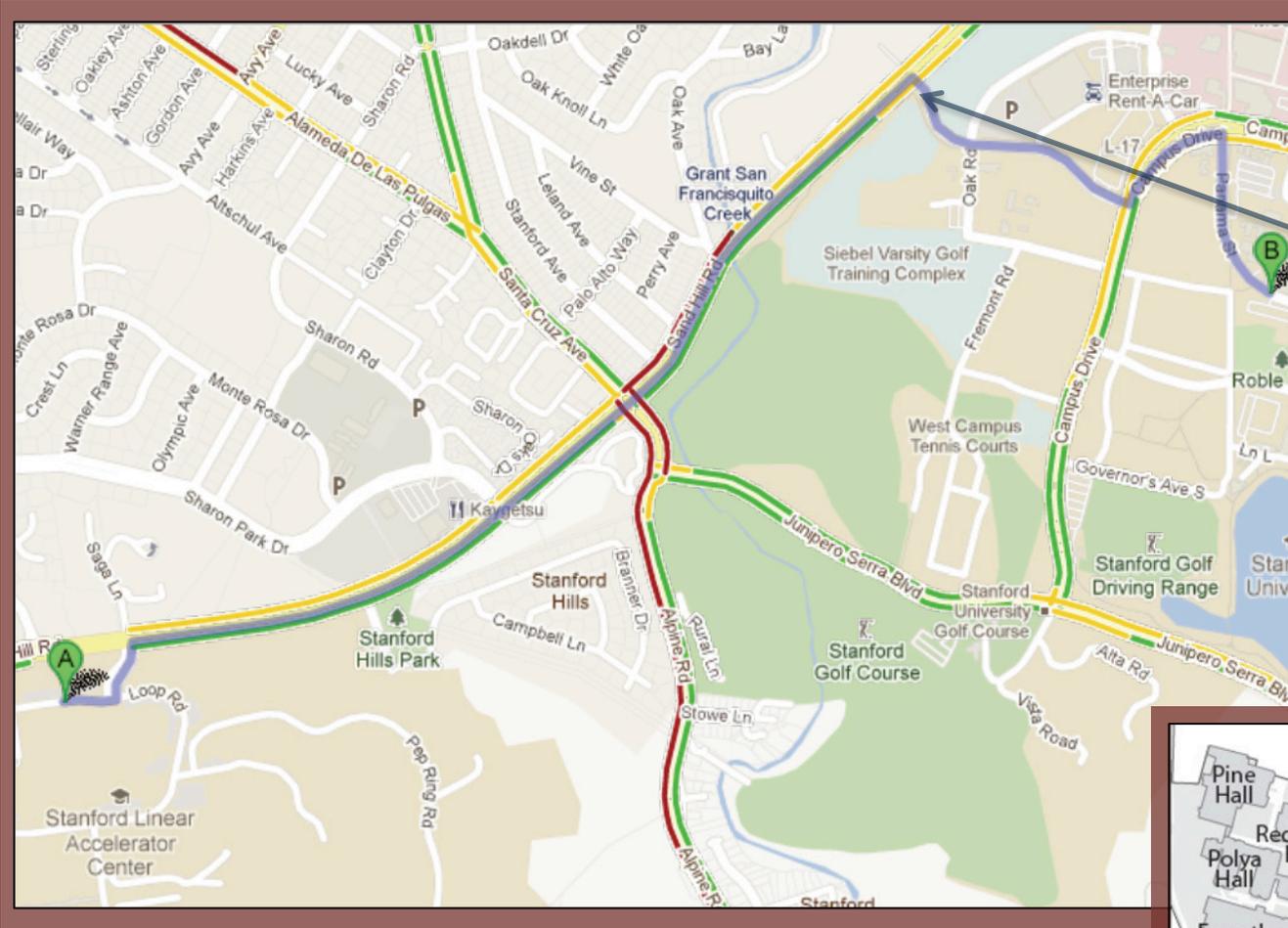
-

**Kavli Institute Auditorium**  
1st Building on Right



# Stanford's PNT Symposium Dinner

## Map from SLAC to Huang Engineering Center



- A** SLAC Kavli Bldg
1. Head east on **Loop Rd**  
Restricted usage road
  2. Turn left toward **Sand Hill Rd**  
Partial restricted usage road
  3. Turn right onto **Sand Hill Rd**  
About 3 mins
  4. Turn right onto **Stock Farm Rd**  
About 1 min
  5. Turn left onto **Campus Drive**  
About 1 min
  6. Turn right onto **Panama St**  
Destination will be on the left
- B** Parking Structure 2, Stanford, CA

Park in any 'A' or 'C' spot  
in Parking Structure #2  
or adjacent Parking Lot

Huang Engineering - Mackenzie Room

