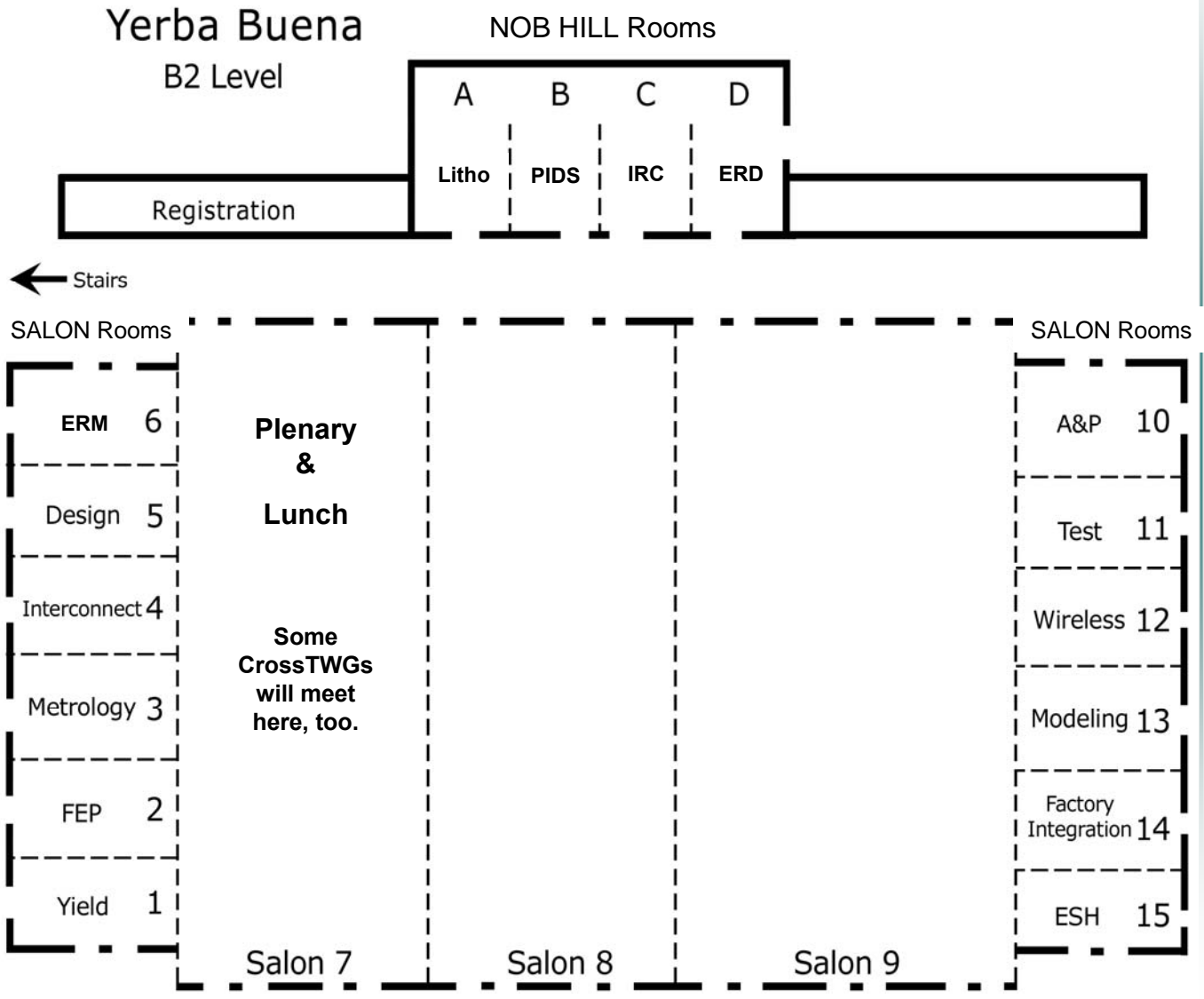


*2009 ITRS IRC/ITWG Summer Workshop
13-14 July 2009
Hotel Marriott
San Francisco*





Note for Weekend ITWG meetings:

Nob Hill D – ERD/ERM

Nob Hill A – Factory Integration



Monday, 13 July -- Marriott Hotel

8:30- 9:00 Registration
9:00-10:00 Plenary Session
10:00-10:30 Break is Available
10:30-12:30 IRC/ITWG Breakouts
12:30-13:30 Lunch
13:30-17:45 IRC/ITWG Breakouts
16:00-16:30 Break is Available
17:45 Adjourn

****NOTE: NO DINNER IS PROVIDED ON MONDAY OR TUESDAY**

Tuesday, 14 July – Marriott Hotel

9:00-12:00 IRC/ITWG Breakouts
10:00-10:30 Break is Available
12:00-13:30 Lunch
13:30-17:00 IRC/ITWG Breakouts
15:30-16:30 Break is Available
17:00-18:15 Plenary Session: Key Messages from all ITWGs
18:15 Adjourn



7:00-8:00	ITRS Breakfast and Registration	
8:00-8:10	Opening Remarks & Orientation	Paolo Gargini
	ESIA	Patrick Cogez
	JEITA	Hidemi Ishiuchi
	KSIA	Joo-Tae Moon
	TSIA	Burn Lin
	SIA	Pushkar Apte
8:10	Session 1 Greetings by Europe IRC	Patrick Cogez
8:10-8:30	Overall Roadmap Technology Characteristics	Alan Allan
8:30-8:45	Process Integration, Devices, and Struc.	Kwok Ng
8:45-9:00	Emerging Research Materials	Mike Garner
9:00-9:15	Emerging Research Devices	Jim Hutchby
9:15-9:20	Q & A	
9:20	Session 2 Greetings by Japan IRC	Hidemi Ishiuchi
9:20-9:35	RF and A/MS Technologies for Wireless Comm	Margaret Huang
9:35-9:50	Metrology	Alain Diebold
9:50-10:05	Environment, Safety and Health	Jim Jewett
10:05-10:20	Front End Processes	Jeff Butterbaugh
10:20-10:25	Q & A	
10:25-10:45	Break	
10:45	Session 3 Greetings by Korea IRC	Joo-Tae Moon
10:45-11:00	Interconnect	Christopher Case
11:00-11:15	Factory Integration	Shigeru Kobayashi
11:15-11:30	Yield Enhancement	Lothar Pfitzner
11:30-11:45	System Drivers	Andrew Kahng
11:45-12:00	Design	Andrew Kahng
12:00-12:10	Q & A	
12:10	Session 4 Greetings by Taiwan IRC	Burn Lin
12:10-12:25	Test and Test Equipment	Roger Barth
12:25-12:40	Lithography	Greg Hughes
12:40-12:55	Modeling and Simulation	Jürgen Lorenz
12:55-1:10	Assembly and Packaging	Bill Bottoms
1:10-1:20	Q & A	
1:20-1:30	Closing Remarks	Paolo Gargini
1:30-2:15	Lunch Break	
2:30-4:00	ITRS Keynote Panel Discussion	George Scalise, moderator
	Novellus Theater / Yerba Buena Center for the Arts	
5:30-7:30	SEMATECH Reception	
	Golden Gate Ballroom / Marriot Hotel	



Coming Soon!

Forums sites for ITWGs—

- **Download and upload files**
- **Post discussions**
- **Receive email notifications when your team posts files or messages.**

Required contact information for TWG team members [domestic and international members]:

- **Name**
- **Affiliation**
- **Email**
- **City**
- **State/Province**
- **Zip**
- **Country**



Day 1 ITWG/IRC Meetings					
	IRC Nob Hill C	Factory Int. (Sunday Nob Hill A) Salon 14	Modeling Salon 13	Assy&Pkg Salon 10	Lithography Nob Hill A
8:30-9:00	Registration				
9:00-10:00	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7
10:00-10:30 Coffee Break is Available					
10:30-11:30	IRC and Factory Integration	[meet in IRC room]	Modeling	Assy&Pkg	Lithography
11:30-12:00	IRC	Factory / Litho	Modeling	Assy&Pkg / Yield	Meet in Factory
12:00-12:30	IRC	Factory	Modeling	Assy&Pkg / ERM	Lithography / Metrology
12:30-13:30	LUNCH				
13:30-14:00	IRC	Factory	Modeling/ ERD	Assy&Pkg/ ESH	Lithography / ERM
14:00-14:45	IRC meet with ESH	Factory	Modeling	Assy&Pkg	[meet in Design area]
14:45-15:30	MtM Meeting with IRC/ TWGs In Plenary Room	Factory	[meet in FEP area]	MtM Meeting with IRC/ TWGs In Plenary Room	Lithography
15:30-16:30		Factory	Modeling / ERM		Lithography / Yield
16:00-16:30 Coffee Break Available					
16:30-17:00	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS	Factory	Modeling	Assy&Pkg	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS
17:00-17:45		Factory	Modeling	Assy&Pkg / Test	
17:45	Adjourn				
18:00					



Day 1 ITWG/IRC Meetings					
	FEP Salon 2	RF/AMS Wireless Salon 12	ESH Salon 15	Interconnect Salon 4	Metrology Salon 3
8:30-9:00	Registration				
9:00-10:00	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7
	10:00-10:30 Coffee Break is Available				
10:30-11:30	FEP	RF/AMS Wireless	ESH	Interconnect	Metrology
11:30-12:00	FEP	[meet in PIDS area]	ESH	[meet in Design area]	Metrology/ ERD
12:00-12:30	FEP/ ERD	RF/AMS Wireless	[meet in Interconnect area]	Interconnect / ESH	[meet in Litho area]
12:30-13:30	LUNCH				
13:30-14:00	FEP / PIDS	RF/AMS Wireless	[meet in Assy&Pkg area]	Interconnect/ Test	Metrology/ Yield
14:00-14:45		RF/AMS Wireless	ESH meeting with IRC	[meet in Yield area]	Metrology
14:45-15:30	FEP / Modeling	MtM Meeting with IRC/ TWGs In Plenary Room	ESH/ERM	MtM Meeting with IRC/ TWGs In Plenary Room	Metrology
15:30-16:30	FEP/ Metrology		ESH		[meet in FEP area]
	16:00-16:30 Coffee Break is Available				
16:30-17:00	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS	RF/AMS Wireless	ESH	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS	Metrology / /ERM
17:00-17:45		RF/AMS Wireless	ESH		Metrology
17:45	Adjourn				
18:00					



CROSS-TWG MEETINGS AND EVENTS

Day 1

Day 1 ITWG/IRC Meetings						
	PIDS Nob Hill B	Yield Enhnc. Salon 1	Design Salon 5	Test Salon 11	ERM Salon 6	ERD Nob Hill D
8:30-9:00	Registration					
9:00-10:00	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7
10:00-10:30 Coffee Break is Available						
10:30-11:30	PIDS	Yield	Design	Test	ERM	ERD
11:30-12:00	PIDS/ Wireless	[meet in Assy&Pkg area]	Design / Interconnect	Test	ERM	Meet in Metrology
12:00-12:30	PIDS	Yield	Design	Test	[ERM meet in Assy&Pkg area]	[Meet in FEP area]
12:30-13:30 LUNCH						
13:30-14:00	[meet in FEP area]	[Meet in Metrology area]	Design	Meet in Interconnect	[Meet in Lithgraphy]	Meet in Modeling
14:00-14:45		Yield / Interconnect	Design / Lithography	Test	ERM	ERD
14:45-15:30	MtM Meeting with IRC/ TWGs In Plenary Room	Yield/ Test	MtM Meeting with IRC/ TWGs In Plenary Room	Meet in Yield	[Meet in ESH area]	MtM Meeting with IRC/ TWGs In Plenary Room
15:30-16:30		[meet in Litho area]		Test	[Meet in Modeling area]	
16:00-16:30 Coffee Break is Available						
16:30-17:00	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS	Test	Meet in Metrology area	Technology Pacing In Plenary Room Meeting with Litho/FEP/Yield Interconnect Design/PIDS
17:00-17:45				[meet in Assy&Pkg area]	ERM	
17:45	Adjourn					
18:00	Registration					



Day 2 ITWG/IRC Meetings					
	IRC Nob Hill C	Factory Int. (WkEnd Nob Hill A) Salon 14	Modeling Salon 13	Assy&Pkg Salon 10	Lithography Nob Hill A
9:00-10:00	Beyond CMOS [IRC, PIDS, ERM, ERD, Design] in Plenary Room, Salon 7	Factory	Modeling	Assy&Pkg / Interconnect	Lithography
10:00-11:00	IRC [*]	Factory/ FEP	Modeling	[meet in Design area]	Lithography
10:00-10:30 Coffee Break is Available					
11:00-11:45	IRC	Factory	Modeling / Interconnect	Assy&Pkg	Lithography
11:45-12:30	IRC	meet in Interconnect	[Meet in Assy&Pkg area]	Assy&Pkg/ Modeling	Lithography
12:30-14:00	LUNCH				
14:00-14:45	IRC meeting with ERD & ERM	Factory/ Yield	Modeling	Assy&Pkg / Wireless	Lithography
14:45-15:30	IRC / ISMI presentation	Factory / Metrology	Modeling	Assy&Pkg-out	Lithography / ESH
15:30-16:00	IRC	Factory	Modeling / PIDS	Assy&Pkg-out	Lithography
16:00-16:30	IRC	Factory/ESH	[meet in Litho area]	Assy&Pkg-out	Lithography / Modeling
15:30-16:30 Coffee Break Available					
16:30-18:15	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7
18:15	Adjourn				
18:30	[*] guests for PV				
18:30					



Day 2 ITWG/IRC Meetings					
	FEP Salon 2	RF/AMS Wireless Salon 12	ESH Salon 15	Interconnect Salon 4	Metrology Salon 3
9:00-10:00	FEP/Yield	RF/AMS Wireless	ESH	[Meet in Assy&Pkg area]	Metrology
10:00-11:00	[Meet in Factory area]	RF/AMS Wireless	ESH	Interconnect/ ERM	Metrology
10:00-10:30 Coffee Break is Available					
11:00-11:45	FEP/ ERM	RF/AMS Wireless	ESH/Yield	[meet in Modeling area]	Metrology
11:45-12:30	FEP	RF/AMS Wireless	ESH	Interconnect/ Factory	Metrology
12:30-14:00	LUNCH				
14:00-14:45	FEP/PIDS Interconnect/ Design - 3D discussion	[Meet in AssyPkg area]	ESH	[meet in FEP area] 3D discussion	Metrology
14:45-15:30		RF/AMS Wireless	[meet in Litho area]		[meet in Factory area]
15:30-16:00	FEP / ESH	RF/AMS Wireless	[meet in FEP area]	[meet in Metrology area]	Metrology / Interconnect
16:00-16:30	FEP	[meet in Test area]	[meet in Factory]	Interconnect	Metrology
15:30-16:30 Coffee Break Available					
16:30-18:15	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7
18:15	Adjourn				
18:30					



CROSS-TWG MEETINGS AND EVENTS

Day 2

Day 2 ITWG/IRC Meetings						
	PIDS Nob Hill B	Yield Enhnc. Salon 1	Design Salon 5	Test Salon 11	ERM Salon 6	ERD (WkEnd Nob Hill D) Nob Hill D
9:00-10:00	Beyond CMOS [IRC, PIDS, ERM, ERD, Design] in Plenary Room, Salon 7	[meet in FEP area]	Beyond CMOS [IRC, PIDS, ERM, ERD, Design] in Plenary Room, Salon 7	Test	Beyond CMOS [IRC, PIDS, ERM, ERD, Design]	Beyond CMOS [IRC, PIDS, ERM, ERD, Design] in Plenary Room, Salon 7
10:00-11:00	PIDS	Yield	Design / Assy&Pkg	Test	[Meet in Interconnect area]	ERD
10:00-10:30 Coffee Break is Available						
11:00-11:45	[meet in Design]	[meet in ESH area]	Design / PIDS	Test	[Meet in FEP area]	ERD
11:45-12:30	[meet in with ERD and ERM in ERM area]	Yield	Design / Test	[meet in Design area]	ERM / PIDS / ERD	[meet with PIDS and ERM]
12:30-14:00	LUNCH					
14:00-14:45	[meet in FEP area] 3D discussion	[Meet in Factory area]	[meet in FEP area] 3D discussion	Test	ERM meeting with IRC	ERD meeting with IRC
14:45-15:30		Yield		Test	Meet in ERD area	ERD/ERM
15:30-16:00	[meet in Modeling area]	Yield	Design	Test	ERM	ERD
16:00-16:30	PIDS	Yield	Design	Test / Wireless	ERM	ERD
15:30-16:30 Coffee Break Available						
16:30-18:15	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7	[at Plenary] Salon 7
18:15	Adjourn					
18:30						



- **Monday—Tuesday:**

- Meet with others to review data for 2009 ITRS: technology pacing, potential solutions, writing review.
- Prepare presentation for Wednesday
 - Highlights and Challenges of 2009
 - *Presentation due Tuesday at plenary!*
 - ITWGs give presentations to Jason Webb.

- **Tuesday Afternoon Plenary 4:30 – 6:15**

- Dry Run of ITWG presentations for Wednesday.
- 1 page summary of key changes to tables and slides in powerpoint for 2009 Update. These will be collected from each team leader.

- **Wednesday**

- Entire ITWG presentations will be available on three computers during conference for viewing and downloading by participants



- ***NEW Look for the ITRS***
- The ITRS is now ***all electronic***
 - ALL Tables will **stay in Excel** files :
 - Focus ITWGS files
 - CrossCut ITWGs files
 - ORTC file
 - Links to the 2009 ITRS chapters files
 - Links to each other files
 - Text for chapters will link to the tables' files
- ***WEBSITE***
 - ITRS website working group login is
“2008 ITRS”, “roadmap”.
These are case sensitive.
- ***Future Fab International***
 - January 2010 entire issue will highlight the new
2009 ITRS



▶ Difficult Challenges Table Guidelines

▶ Near-term ($\geq 16\text{nm}$)





▶ Long-term ($< 16\text{nm}$)

▶ **TEN Total Challenges ONLY**

Target the Top 5 most difficult challenges for near-term ($\geq 16\text{nm}$) and the Top 5 most difficult challenges for long-term ($< 16\text{nm}$)

- ▶ Timeframe advances two years **2009—2024**
- ▶ Numbering for Tables, Figures, and Citations are self-consistent within each chapter.
 - ▶ Tables and Figures use a prefix for each chapter, e.g.,
FEP tables start at FEP1; Lithography tables start at LITH1

Technology Requirements Guidelines:

<i>Manufacturable solutions exist, and are being optimized</i>	
<i>Manufacturable solutions are known</i>	
<i>Interim solutions are known</i>	
<i>Manufacturable solutions are NOT known</i>	

- ▶ **Yellow cannot exist** in next **1** year (2009)
- ▶ **Red cannot exist** in next **3** years (2009, 2010, 2011**)





** An ITWG can have an exception *approved through the IRC:*

“Solution NOT known, but does not prevent production manufacturing.”



Potential Solutions Guidelines

- ▶ Review solutions for assessed needs— do not select only one solution; provide for innovative answers
- ▶ Template for Potential Solution is provided as an **EXCEL worksheet.**

<i>Research Required</i>	
<i>Development Underway</i>	
<i>Qualification / Pre-Production</i>	
<i>Continuous Improvement</i>	

- **Outline for ITWG chapters**
[same as 2007 ITRS]
 - **Scope**
 - **Difficult Challenges**
 - **Technology Requirements**
 - **Potential Solutions**
 - **Cross TWG Issues**
 - **Inter-focus ITWG Discussions**
 - **Impact of Future Emerging Research Devices**
 - **References/Works Cited**

- **File types:** Microsoft Office 2003 –
Word, Excel, Visio,
Powerpoint

- **CONVERT 2007 OFFICE FILES TO 2003
FILES TO AVOID FONT PROBLEMS!**



IRC NEEDS

– extracted from each ITWG chapter:

- ▶ **1 page summary of Key Challenges or Revisions to be included in the Executive Summary**

- ▶ **Any content regarding energy [savings, conservation, waste reduction, targets, costs, etc.]**

TABLE TEMPLATES

- An **EXCEL** provided after all tables are approved, with all **Technology Requirements** tables
 - Already annualized and formatted for 2009 years with correct timeline.
 - ALL tables and notes will be in the excel file. [even text tables]

TEXT TEMPLATES

- A **WORD** file provided contains the **2007 ITWG chapter text**, any 2008 Update text and figures.

CHART TEMPLATES

- A **EXCEL** template provided for **Potential Solutions** figures. The ITRS team then redraws in Visio.
 - Refer to the Word chapters for 2007 Potential Solutions as a start



- There are **limitations on chapter size.**
- **Each chapter will remain at the size of their 2007 chapter.**
- **Each ITWG chair must decide how best to allow for new material by summarizing and deleting outdated material**
 - **Chapters that submitted with too many pages will be edited to the 2007 length for readability**

Chapter	Pages
• ORTC/Executive Summary	90
• Design	42
• System Drivers	24
• Test and Test Equipment	62
• Process Integration, Devices and Structures [PIDS]	59
• RF and A/MS for Wireless	38
• Emerging Research Devices [ERD]	51
• Emerging Research Materials [ERM]	49
• Front end Processes [FEP]	61
• Lithography	30
• Interconnect	63
• Factory Integration	41
• Assembly and Packaging [AP]	77
• Environment, Safety, and Health [ESH]	29
• Yield Enhancement	45
• Metrology	46
• Modeling and Simulation	41
• Total pages	848



2009 Edition Schedule

- ▶ July 13 – 14 ITRS ITWG/IRC meeting in San Francisco at the Hotel Marriott
- ▶ July 15 ITRS Public Conference at the Hotel Marriott
- August 1** ***ALL FINAL TABLES DUE [previous July 20]***
- August 7** ***Tables' files sent out by editor for final review by TWG teams.***
- SEP 15** ***2009 ITRS CONTENT IS FROZEN , Everything is DUE.***
- No More Group Reviews or Input after September 15!
[late chapter material deferred to 2010 ITRS]***
- Oct Regional Executives Advisory boards approve ITRS
- Nov Presentation Drafts due for preparing for December Public meeting materials
- ▶ Dec 14-15 ITRS ITWG/IRC workshop
Location TBD in Taiwan
- ▶ Dec 16 ITRS Public Conference TBD in Taiwan
- December** ***2009 ITRS is posted online for the public***



**The ITRS teams thank the following for
their support for the ITRS Summer workshop:**

