

IBIS Chair's Report

Randy Wolff
Micron Technology
Chair, IBIS Open Forum

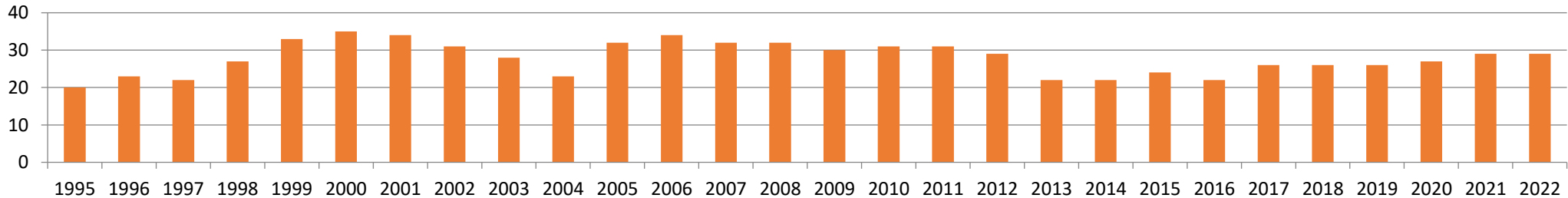
2022 Virtual Asian IBIS Summit – Japan
November 11, 2022



29 IBIS Members (Organization-based)



Number of Members by Year



IBIS Officers June 2022- May 2023

Chair: *Randy Wolff, Micron Technology*

Vice-Chair: *Lance Wang, Zuken USA*

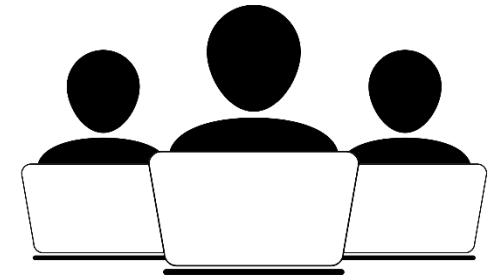
Secretary: *Graham Kus, MathWorks*

Treasurer: *Bob Ross, Teraspeed Labs*

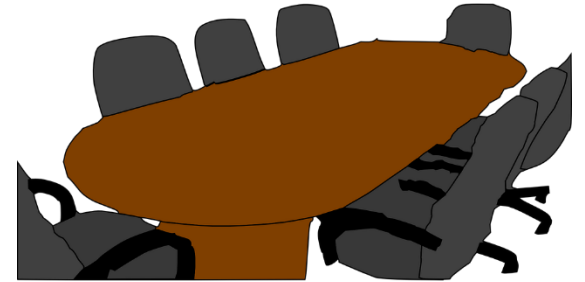
Librarian: *Zhiping Yang, Waymo*

Postmaster: *Curtis Clark, ANSYS*

Webmaster: *Steve Parker, Marvell*



IBIS Meetings



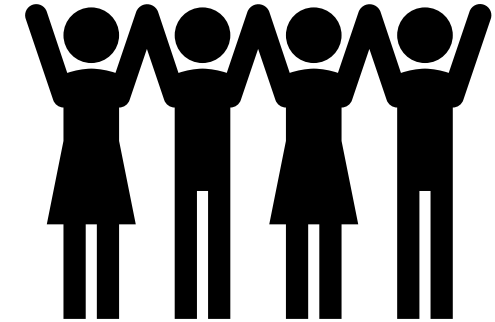
- Weekly teleconferences
 - Quality task group (Tuesdays, 09:00 PT)
 - Advanced Technology Modeling (ATM) task group (Tuesdays, 12:00 PT)
 - Interconnect task group (suspended)
 - Editorial task group (Wednesdays, 08:00 PT)
- IBIS Open Forum teleconference every 3 weeks (Fridays, 08:00 PT)
- IBIS Summit meetings (USA and international)
 - DesignCon, IEEE SPI, IEEE EMC+SIPI, Shanghai, Taipei, Tokyo (JEITA-organized)
- Participants: ~275 in 2021

SAE ITC

- SAE Industry Technologies Consortia is the parent organization of the IBIS Open Forum
- IBIS is assisted by SAE employees José Godoy, Phyllis Gross, and Michael McNair
- SAE ITC provides financial, legal, and other services
- <https://www.sae-itc.com/>



Task Groups



- Advanced Technology Modeling Task Group
 - Chair: Arpad Muranyi, Siemens EDA
 - https://ibis.org/atm_wip/
 - Develop non-interconnect technical BIRDS
- Editorial Task Group
 - Chair: Michael Mirmak, Intel
 - https://ibis.org/editorial_wip/
 - Produce IBIS specification documents
- Interconnect Task Group
 - Chair: Michael Mirmak, Intel
 - https://ibis.org/interconn_wip/
 - Develop on-die/package/module/connector interconnect modeling BIRDS
- Quality Task Group
 - Chair: Bob Ross, Teraspeed Labs
 - https://ibis.org/quality_wip/
 - Oversee IBISCHK parser testing and development

BIRD = Buffer Issue Resolution Document

IBIS Milestones

I/O Buffer Information Specification

- 1993-1994 **IBIS 1.0-2.1:**
 - Behavioral buffer model (fast simulation)
 - Component pin map (easy EDA import)
- 1997-1999 **IBIS 3.0-3.2:**
 - Package models
 - Electrical Board Description (EBD)
- 2002-2006 **IBIS 4.0-4.2:**
 - Receiver models
 - AMS languages
- 2007-2012 **IBIS 5.0-5.1:**
 - IBIS-AMI SerDes models
 - Power-aware model

I/O Buffer Information Specification

- 2013-2015 **IBIS 6.0-6.1:**
 - PAM4 multi-level signaling
 - Power delivery package models
- 2019 **IBIS 7.0:**
 - Back-channel time-domain support
 - Interconnect modeling using IBIS-ISS and Touchstone
- 2021 **IBIS 7.1:**
 - DDRx IBIS-AMI support
 - Electrical Module Description (EMD)
 - IBIS-AMI back-channel statistical optimization

Other Work

- 1995: **ANSI/EIA-656 (IBIS 2.1 International standard)**
- 1999: **ANSI/EIA-656-A (IBIS 3.2 International standard)**
- 2001: **IEC 62014-1 (IBIS 3.2 International standard)**
- 2003: **Interconnect Model Specification (ICM 1.0)**
- 2006: **ANSI/EIA-656-B (IBIS 4.2 International standard)**
- 2009: **Touchstone 2.0**
 - Official Touchstone donated from Agilent/Keysight
- 2011: **IBIS-ISS 1.0 (Interconnect SPICE Subcircuit)**
 - Subset of HSPICE
- **IBISCHK:** IBIS file syntax parser
 - Current version 7.1.0
 - Source code available for purchase
 - Compiled executables available free of charge
- **TCHK2:** Touchstone 2.0 file syntax parser
 - Current version 2.0.1
 - Source code available for purchase
 - Compiled executables available free of charge

Planning for IBIS Version 7.2

Current official BIRD content for IBIS 7.2

BIRD ID	BIRD Title	Approval Date	Notes
211.4	IBIS AMI Reference Flow Improvements	April 1, 2022	IBIS-AMI
213.1	Extending IBIS-AMI for PAMn Analysis	July 22, 2022	IBIS-AMI
216	Alphanumeric Pin Names	March 11, 2022	[Pin] clarification
217	Require Clocked Rx Models to Return Clock Times	March 11, 2022	IBIS-AMI
218	Designator Pin List Relaxation	April 22, 2022	EMD
219.1	AMI Parameter Root Name Clarifications	August 12, 2022	IBIS-AMI

- Major technical changes are IBIS-AMI focused:
 - Redriver simulation flow fixes (BIRD211.4)
 - PAMn (BIRD213.1)
- BIRD217 requires a `clock_times` output for new DDRx IBIS-AMI Data Rx models with the Clock input, since these models do not have a CDR. Adds recommendation for all Rx models to return valid `clock_times`
- BIRD218 removes a restriction in EMD. Will make EMD models easier to create
- Will fix many editorial issues in IBIS 7.1
- BIRD in progress from Editorial task group clarifies “`clock_times`” input usage for an `AMI_GetWave` function with a clocked Rx IBIS-AMI model
- IBIS 7.2 expected approval in early 2023

What's Next for IBIS?

- IBIS Open Forum's highly collaborative task groups are up for the challenge of addressing the SI and PI demands of new signaling technologies:
 - Expanded system-level perspective
 - Clock/data relationships, timing information, equalization training
 - Power Integrity focused modeling
 - Improved Power Supply Induced Jitter (PSIJ) modeling
 - Diode and inductor models
 - Voltage regulator models
 - Chip-level Standard Power Integrity Model (SPIM)
 - Interconnect Modeling
 - Touchstone 3.0
 - Pole/Residue support
 - Port mapping
 - IBIS-ISS expansions

Participation in IBIS

- The success of IBIS depends on active participation and volunteering
- Bringing your ideas and talents to IBIS
 - Task groups for technical discussions and document editing
 - IBIS email reflectors
 - Open Forum teleconferences for event planning and voting
 - Summit presentations
 - IBIS Board and task group volunteering
 - Writing BIRDs – Buffer Issue Resolution Documents
 - Official method for submitting a proposed change to the IBIS specification
 - Many developed collaboratively in task groups
 - Discussed and voted on in Open Forum meetings



IBIS Website Resources

IBIS Summits

Task Group Info

Spec documents

BIRDs List

Email support

Syntax Parser

Downloads

The screenshot shows the IBIS Open Forum website. The left sidebar contains a navigation menu with the following items: **Upcoming Events**, **Past Summits**, **Open Forum** (Minutes), **Regional Forums** (China), **Task Groups** (ATM, Quality, Interconnect, Editorial), **Members** (Roster), **Specifications** (BIRDs, ISSIRDs, TSIRDs), **Models**, **Support** (Model Review, Training), **FREE Tools**, **IBIS Parsers** (IBISCHK, IBISCHK Bugs, TSCHK, TSCHK Bugs), **IBIS Cookbook**, **Accuracy Handbook**, **Site Map**, **About IBIS** (Articles, FAQ). The main content area features a header "Welcome to the IBIS Open Forum", two "NEW" news items, a table of specifications, and a grid of member logos.

Specification Name	Version	Standard Reference
I/O Buffer Information Specification	(IBIS 7.1)	(SAE/EIA-STD-656-B) (IEC-62014-1)
IBIS Interconnect Modeling Specification	(ICM 1.1)	(SAE/GEIA-STD-0001)
IBIS Interconnect SPICE Subcircuit Specification	(IBIS-ISS 1.0)	
Touchstone® File Format Specification	(Touchstone 2.0)	

Our Members

Logos displayed include: ANALOG DEVICES, Ansys, APPLIED SIMULATION TECHNOLOGY, Aurora System, BROADCOM, cadence, Celestica, CISCO, DASSAULT SYSTEMES, Google, HUAWEI, infineon, instituto de telecomunicações, intel, KEYSIGHT, LUMINOUS, MARVELL, MathWorks, Micron, MISSOURI S&T, SerDes Design.Com, SIEMENS, life.augmented, ST, SYNOPSYS, Teraspeed Labs, WAYMO, XILINX, ZTE, ZUKEN.

[Thank You]



IBIS Open Forum:
Web: <https://ibis.org>
Email: info@ibis.org

We welcome participation
by all IBIS model makers,
EDA tool vendors, IBIS model
users, and interested parties.