

# IBIS Chair's Report

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Randy Wolff  
Micron Technology  
Chair, IBIS Open Forum

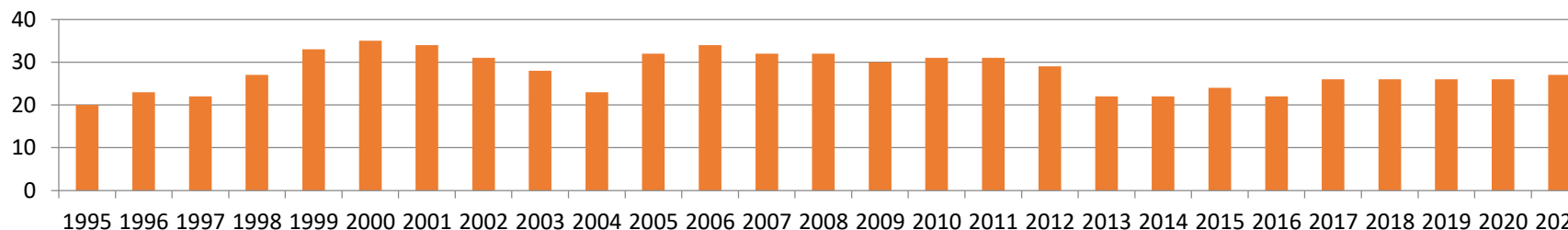
IBIS Summit at 2020 IEEE Virtual Symposium on EMC+SIPI  
August 28, 2020



# 27 IBIS Members (Organization-based)

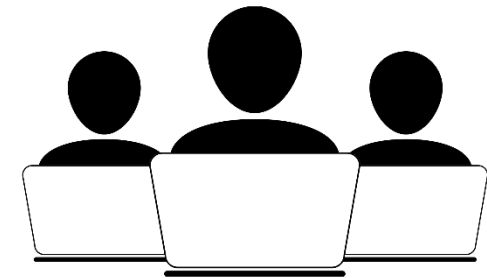


Number of Members by Year

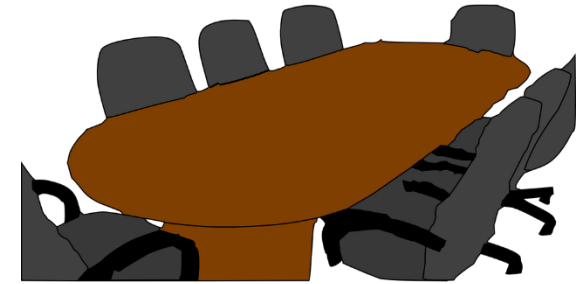


# IBIS Officers 2020-2021

- Chair: *Randy Wolff, Micron Technology*
- Vice-Chair: *Lance Wang, Zuken USA*
- Secretary: *Curtis Clark, ANSYS*
- Treasurer: *Bob Ross, Teraspeed Labs*
- Librarian: *Anders Ekholm, Ericsson*
- Postmaster: *Mike LaBonte, SiSoft (MathWorks)*
- Webmaster: *Steve Parker, Marvell*



# IBIS Meetings



- Weekly teleconferences
  - Quality task group (Tuesdays)
  - Advanced Technology Modeling (ATM) task group (Tuesdays)
  - Interconnect task group (Wednesdays)
  - Editorial task group (some Fridays)
- IBIS Open Forum teleconference every 3 weeks
- IBIS Summit meetings (USA and international)
  - DesignCon, IEEE SPI, Shanghai, Taipei, Tokyo (JEITA-organized), IEEE EMC+SIPI
- Participants: 368 in 2019

# 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, Laurie Strom
- SAE ITC provides financial, legal, and other services
- <http://www.sae-itc.org/>



# Task Groups



- Interconnect Task Group
  - Chair: Michael Mirmak, Intel
  - [http://ibis.org/interconn\\_wip/](http://ibis.org/interconn_wip/)
  - Develop on-die/package/module/connector interconnect modeling BIRDs
- Advanced Technology Modeling Task Group
  - Chair: Arpad Muranyi, Mentor, A Siemens Business
  - [http://ibis.org/atm\\_wip/](http://ibis.org/atm_wip/)
  - Develop most other technical BIRDs
- Quality Task Group
  - Chair: Mike LaBonte, SiSoft (MathWorks)
  - [http://ibis.org/quality\\_wip/](http://ibis.org/quality_wip/)
  - Oversee IBISCHK parser testing and development
- Editorial Task Group
  - Chair: Michael Mirmak, Intel
  - [http://ibis.org/editorial\\_wip/](http://ibis.org/editorial_wip/)
  - Produce IBIS Specification documents

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 models
- 2013-2015 **IBIS 6.0-6.1:**
  - PAM4 multi-level signaling
  - Power delivery package models
- 2019 **IBIS 7.0:**
  - Back-channel support
  - Interconnect modeling using IBIS-ISS and Touchstone
- 2020-2021 **IBIS 7.1 (in progress)**

## Other Work

- 1995: **ANSI/EIA-656 (International standard)**
  - IBIS 2.1
- 1999: **ANSI/EIA-656-A (International standard)**
  - IBIS 3.2
- 2001: **IEC 62014-1(International standard)**
  - IBIS 3.2
- 2003: **ICM 1.0**
  - Interconnect Model Specification
- 2006: **ANSI/EIA-656-B (International standard)**
  - IBIS 4.2
- 2009: **Touchstone 2.0**
  - Official Touchstone donated from Agilent/Keysight
- 2011: **IBIS-ISS 1.0**
  - Interconnect SPICE Subcircuit specification (subset of HSPICE)
- **IBISCHK: IBIS file syntax parser**
  - Current version 7.0.2 (8/7/2020)
  - Source code available for purchase
  - Compiled executables available free of charge

# Planning for IBIS Version 7.1

## BIRDs approved for 7.1

BIRD ID	BIRD Title	Approval Date
195.1	<a href="#">Enabling [Rgnd] and [Rpower] Keywords for Input Models</a>	August 31, 2018
197.7	<a href="#">New AMI Reserved Parameter DC_Offset</a>	February 21, 2020
198.3	<a href="#">Keyword Additions for On-Die PDN (Power Distribution Network) Modeling</a>	August 7, 2020
199	<a href="#">Fix Rx Receiver Sensitivity Inconsistencies</a>	June 7, 2019
200	<a href="#">C_comp Model Using IBIS-ISS or Touchstone</a>	September 27, 2019
201.1	<a href="#">Back-channel Statistical Optimization</a>	July 17, 2020
203	<a href="#">Submodel Clarification</a>	April 24, 2020
204	<a href="#">DQ_DQS GetWave Flow for Clock Forwarding Modeling</a>	June 26, 2020
205	<a href="#">New AMI Reserved Parameter for Sampling Position in AMI_Init Flow</a>	June 26, 2020

## BIRDs expected to be approved

BIRD ID	BIRD Title	Tentative Vote Date
202	<a href="#">Electrical Descriptions of Modules</a>	October 30, 2020
206	<a href="#">Clarification of text "transition time"</a>	September 18, 2020
207	<a href="#">New AMI Reserved Parameters Component_Name and Signal_Name</a>	October 9, 2020



# What's Next for IBIS?

- IBIS has traditionally focused on I/O buffers and interconnect, for:
  - Solving signal integrity issues from channel loss, inter-symbol interference (ISI), and crosstalk
  - Generating waveforms or eye diagrams for timing or bit-error-rate analysis
- IBIS must continue to evolve to meet both the SI and PI demands of new signaling technologies
  - Power Distribution Network (PDN) design is a critical piece of overall system design
  - Potential for IBIS to enable improved modeling/analysis of PDN
    - Voltage regulator models
    - Chip power models

# Submitting Your Idea – BIRD Process

- BIRD – Buffer Issue Resolution Document
  - Official method for submitting a proposed change to the IBIS specification
- BIRD Template found on IBIS website
  - Standardizes method to describe your idea
- Submit BIRD to [chair@ibis.org](mailto:chair@ibis.org)
- BIRDs discussed in Open Forum meetings
  - Eventual vote by members for approval
- Idea not ready for an official BIRD?
  - Join an IBIS Task Group meeting for technical discussion



# BIRD Link on IBIS Website

The screenshot shows the IBIS website interface. The browser address bar displays <https://ibis.org/>. The main header reads "Welcome to the IBIS Open Forum". A yellow banner at the top right states "NEW IBIS Parser IBISCHK7 is now available : [IBISCHK7](#)".

The left sidebar contains the following navigation items:

- Upcoming Events
- Past Summits
- Open Forum
- Minutes
- Regional Forums
- China
- Task Groups
- ATM
- Quality
- Interconnect
- Editorial
- Members
- Roster
- Specifications
- BIRDs** (circled in green)
- 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 is divided into two sections:

- Our Specifications**:
  - I/O Buffer Information Specification ([IBIS 7.0](#)) ([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**: A grid of logos for member companies including Ansys, Applied Simulation Technology, Broadcom, Cadence, Cisco, Dassault Systemes, Ericsson, Google, Huawei, IBM, Infineon, Instituto de Telecomunicações, Intel, Keysight Technologies, Marvell, Maxim Integrated, Mentor (A Siemens Business), NXP, Micron, SerDes Design.Com, SiSoft, Synopsys, Teraspeed Labs, Xilinx, and Zuken.

Link to BIRDs webpage

# BIRD Template Link on the BIRD Webpage

## Buffer Issue Resolution Documents (BIRD)

To submit a BIRD to the IBIS Open Forum, please use the [BIRD Template, Rev. 1.3](#).

ID#	Issue Title	Requester	Date Submitted	Date Accepted	Supporting Version
207	<a href="#">New AMI Reserved Parameters Component_Name and Signal_Name</a>	Randy Wolff, Micron Technology	July 29, 2020		
206	<a href="#">Clarification of text "transition time"</a>	Hansel Desmond Dsilva, Achronix Semiconductor; Walter Katz, Signal Integrity Software; Fangyi Rao, Keysight; Todd Bermensolo, Keysight; Arpad Muranyi, Mentor Graphics.	June 26, 2020		
205	<a href="#">New AMI Reserved Parameter for Sampling Position in AMI_Init Flow</a>	Hansel Desmond Dsilva, Achronix Semiconductor; Walter Katz, Signal Integrity Software; Todd Bermensolo, Keysight; Fangyi Rao, Keysight; Arpad Muranyi, Mentor Graphics; Amrbrish Varma, Cadence	May 14, 2020	June 26, 2020	
204	<a href="#">DQ_DQS GetWave Flow for Clock Forwarding Modeling</a>	Walter Katz, The MathWorks Fangyi Rao, Keysight Wendem Beyene, Intel Amrbrish Varma, Cadence	April 22, 2020	June 26, 2020	
203	<a href="#">Submodel Clarification</a>	Randy Wolff, Micron Technology	March 10, 2020	April 24, 2020	
202	<a href="#">Electrical Descriptions of Modules</a>	Walter Katz, Signal Integrity Software	January 22, 2020		
201.1	<a href="#">Back-channel Statistical Optimization</a>	Walter Katz, Signal Integrity Software	January 7, 2020, June 2, 2020	July 17, 2020	
200	<a href="#">C_comp Model Using IBIS-ISS or Touchstone</a>	Randy Wolff, Micron Technology, Inc. Walter Katz, Signal Integrity Software, Inc.	July 9, 2019	September 27, 2019	
199	<a href="#">Fix Rx_Receiver_Sensitivity Inconsistencies</a>	Arpad Muranyi, Mentor a Siemens Business	March 19, 2019	June 7, 2019	
198.2	<a href="#">Keyword Additions for On-Die PDN (Power Distribution Network) Modeling</a>	Kazuki Murata; Sony LSI Design Inc.; Miyoko Goto; Ricoh Co., Ltd.; Kazuyuki Sakata; Renesas Electronics Corporation; Kazunori Yamada; Renesas Electronics Corporation; Kouji Ichikawa; Denso Corporation; Atsushi Tomishima; Toshiba Electronic Devices & Storage Corporation; Takashi Hasegawa; Sony LSI Design Inc.; Koichi Seko, Panasonic Industrial Devices Systems and Technology Co., Ltd.; Toshiki Kanamoto; Hirosaki University Megumi Ono; Socionext Inc.	March 11, 2019, April 3, 2020, June 23, 2020		

# [Thank You]



IBIS Open Forum:

Web: <https://www.ibis.org>

Email: [ibis-info@freelists.org](mailto:ibis-info@freelists.org)

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