# IBIS Hybrid European Summit at SPI 2025 Minutes

Meeting Date: **May 14, 2025**
Meeting Location: **Gaeta, Italy**

## VOTING MEMBERS AND 2025 PARTICIPANTS

| | |
|---|---|
| Altair | (JuneSang Lee) |
| AMD | (Bassam Mansour) |
| Analog Devices | Jermaine Lim-Abroguena*, Francis Ian Calubag*, Toni Rose Racelis*, Keshav Mehrotra*, Vincent Paul Sabillo*, Esther Grace Falate* |
| Ansys | Curtis Clark |
| Ansys Japan | Satoshi Endo |
| Applied Simulation Technology | (Fred Balistreri) |
| Aurora System | Raj Raghuram |
| Broadcom | (Yunong Gan) |
| Cadence Design Systems | Kyle Lake, Ambrish Varma |
| Ciena | (Stephen Shew) |
| Cisco Systems | (Stephen Scearce) |
| Dassault Systemes | (Stefan Paret) |
| GE Healthcare Technologies | (Balaji Sankarshanan) |
| Google | (Hanfeng Wang) |
| Huawei Technologies | (Hang (Paul) Yan) |
| Infineon Technologies AG | (Christian Sporrer), Matthias Knopf* |
| Intel Corporation | Michael Mirmak*, Hsinho Wu |
| Keysight Technologies | Pegah Alavi, Fangyi Rao, Ming Yan |
| Marvell | Steven Parker |
| MathWorks | Jonathan Adams, Esa Adil, Walter Katz*, Ganesh R. Rathinavel, Kerry Schutz, [Graham Kus] |
| Micron Technology | (Justin Butterfield) |
| MST EMC Lab | Yifan Ding, Chulsoon Hwang, Zhiping Yang* |
| SI-Clarity | Doug Burns* |
| Siemens EDA | Weston Beal, Matthew Leslie, Jessi Lipoth, Zilwan Mahmod, Arpad Muranyi*, Scott Wedge, Todd Westerhoff, Randy Wolff* |
| Signal Edge Solutions | Benjamin Dannan |
| STMicroelectronics | (Olivier Bayet), Raushan Kumar*, Rahul Kumar*, Anil-Kumar Dwivedi*, Hemant Kumar Gangwar*, Manish Bansal*, Pallav Kumar*, Pranav Singh*, Sachin Yadav* |
| Synopsys | Ted Mido, Diasuke Yamazaki, Jian Yang |
| ZTE Corporation | (Zhongmin Wei), Manisha Bisht* |
| Zuken | (Ralf Brüning), Markus Bücker* |
| Zuken USA | [Lance Wang] |

## OTHER PARTICIPANTS IN 2025

| | |
|---|---|
| Alphawave Semi | Todd Bermensolo |
| Applied Logix | Dan Chirpich |
| ARM | Kinger Cai |
| Ciena | Rolynd T. Aquino |
| FJscaler | Ron Olisar |
| IIT Jodhpur | Anuj Kumar* |
| Kioxia | Masato Kanie |
| Nokia | Graham Kus*, Tyler Swan* |
| NXP Semiconductors | Anurag Singh*, Achraf Mellouki* |
| Politecnico di Torino | Paolo Manfredi*, Antonio Carlucci*, Michele Cusano*, Marco Atlante*, Stefano Grivet-Talocia*, Riccardo Trinchero* |
| SAE ITC | Tammy Patton |

| | |
|---|---|
| Teradyne | Tomoo Tashiro |
| TSMC Japan 3DIC R+D Center | Raymond Yakura |
| Unaffiliated | Lance Wang |
| ZT Systems / AMD | Lu-Vong Phan, Saish Sawant |

In the list above, attendees present at the meeting are indicated by "*" Those submitting an email ballot for their member organization for a scheduled vote are indicated by "^." Principal members or other active members who have not attended are in parentheses "( )." Participants who no longer are in the organization are in square brackets "[ ]."

## UPCOMING MEETINGS

The connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting
**Join on your computer or mobile app**
Click here to join the meeting

**Join with a video conferencing device**
106010980@teams.bjn.vc
Video Conference ID: 114 666 897 5
Alternate VTC dialing instructions

**Or call in (audio only)**
+1 267-768-8015,554664847# United States, Philadelphia
Phone Conference ID: 554 664 847#
Find a local number | Reset PIN
Learn More | Meeting options

All teleconference meetings are 8:00 a.m. to 9:55 a.m. US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting.

NOTE: "AR" = Action Required.

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## SUMMIT MINUTES - SUMMARY AND LINKS

The 2025 IBIS European Summit was held both online and in-person at SPI 2025 in Gaety, Italy.

The notes below capture key content and discussions. A summit recording has been made available in 2 parts where time index is relative to the beginning of each part. The meeting presentations and other documents are available at this link:

Link: https://www.ibis.org/summits/may25/

## OFFICIAL OPENING AND AGENDA

(Start 00:00:00, To 00:05:32. *Note: beginning of recording 1 of 2*)

Markus Bücker from Zuken acted as the on-site host for this IBIS summit. Markus opened the meeting with remarking that the SPI conference had been great experience thus far. He expressed thanks for IBIS organization for hosting the event, and expressed thanks to Zuken Marketing Dept. for sponsoring the refreshments and the IBIS summit room. Markus introduced Doug Burns to open the meeting.

Doug introduced himself as the Acting Chair of the IBIS Open Forum. Doug express thanks to the attendees. He expressed this is very important to getting the word out about collaboration and getting IBIS out into the world, including Asia, Europe and the USA. It is a great way to unify people's thoughts and we encourage people from across domains to join- aerospace, automotive, computers, networking, you name it. We encourage those to join as we work on our specifications to meet industry needs now and into the future.

Doug pointed out the website www.ibis.org contains all information needed such as links to latest versions to IBIS and Touchstone specification, IBISCHK, Quality, and meeting minutes. All things needed to be successful in simulation with IBIS and Touchstone.

Doug expressed welcome and hoped to have a fun and informative day.

A copy of the agenda for this IBIS summit is available at this link:

Link: https://www.ibis.org/summits/may25/

**IBIS CHAIR'S REPORT**

Doug Burns (SI-Clarity, USA)

(Acting Chair, IBIS Open Forum)

(Start 00:05:32, To 00:46:50)

Doug Burns reported that he was now Acting Chair of IBIS Open Forum, as Lance Wang had moved on from his position and no longer represented an IBIS member organization. IBIS bylaws require the Chair to be an active member representative so this is why Doug had taken up the position as Acting Chair from Vice Chair.

Doug expressed thanks to Lance for his duties, and stated that Lance had done a fantastic job leading IBIS, and expressed hope to be able to keep that legacy moving forward.

Doug presented on the following:

- 28 IBIS Members
  - Fairly stable around approximately 30 members over many years. High of 35, settled in between 28-29 being the norm. Many companies are EDA companies or designing silicon. A lot of them are going into computers, networking, some automotive, and looking to bring in aerospace. Also there have been many acquisitions over the years.
- Roster of IBIS Officers June 2024 – May 2025
  - Summary of elected individuals representing organizations on board:
    - Acting Chair: Douglas Burns, SI-Clarity LLC
    - Vice Chair: Douglas Burns, SI-Clarity LLC
    - Secretary: Graham Kus, Nokia
    - Treasurer: Randy Wolff, Siemens EDA
    - Librarian: Zhiping Yang, MST
    - Postmaster: Curis Clark, ANSYS
    - Webmaster: Steven Parker, Marvell
    - Additional liaison positions:
      - University Relations: Chulsoon Hwang, MST

            - IEEE DASC Liaison: Michael Mirmak, Intel
        - Doug underscored he was elected Vice Chair and is now Acting Chair due to recent events in compliance with IBIS bylaws.
- IBIS Meetings (weekly teleconferences)
    - Quality task group (Tuesdays, 9:00 PT)
    - Advanced Technology Modeling (ATM) task group (Tuesdays, 12:00 PT)
    - Interconnect task group (Wednesdays, 8:00 PT)
    - Editorial task group (suspended pending IBIS specification drafts)
- IBIS Open Forum teleconference every 3 weeks (Fridays, 08:00 PT)
- IBIS Summit meetings (USA and international)
    - DesignCon, IEEE SPI, IEEE EMC+SIPI, Shanghai, Tokyo (JEITA-organized)
- Participants: ~290 in 2024
    - Participants listing
- SAE Industry Technologies Consortia is the parent organization of the IBIS Open Forum
    - SAE ITC provides financial, legal, and other services to the IBIS Open Forum:
    - Link: https://www.sae-itc.com/
    - SAE ITC representatives: Tammy Patton, Phyllis Gross, and Rich Demary
- Task Groups
    - Advanced Technology Modeling (ATM) task group (Tuesdays, 12:00 PT)
        - Chair: Arpad Muranyi, Siemens EDA
        - https://ibis.org/atm_wip/
        - Develop non-interconnect technical BIRDs
    - Editorial task group (Suspended)
        - Chair: Michael Mirmak, Intel
        - https://ibis.org/editorial_wip/
        - Produce IBIS specification documents
    - Interconnect task group (Wednesdays, 08:00 PT)
        - Chair: Michael Mirmak, Intel
        - https://ibis.org/interconn_wip/
        - Develop on-die/package/module/connector interconnect modeling BIRDs
    - Quality task group (Tuesdays, 09:00 PT)
        - Acting Chair: Randy Wolff, Siemens EDA
        - https://ibis.org/quality_wip/
        - Oversee IBISCHK parser testing and development
- IBIS Milestones
    - Various accomplishments and industry-associated activities shown in slides (Time index: 00:26:08)
- Other Work
    - Specification Development
        - BIRDs planned for IBIS 8.0 (Time index: 00:27:49)

  - IBIS work includes governing Touchstone 1.0 and Touchstone 2.1 specifications
    - Touchstone 2.1 specification passed January 2024 (Time index: 00:29:58)
  - IBISCHK: IBIS file syntax parser
    - Parser 7.2.1 delivered December 21, 2023 (Time index: 30:41)
  - TSCHK2: Touchstone file syntax parser
  - Both have freely available executables
  - Both source code by subscription if embedding in EDA tool
- BIRD description (Buffer Issue Resolution Document)
  - Summary of present BIRDs considered for adoption
- TSIRD description (Touchstone Issue Resolution Document)
  - Summary of present TSIRDs considered for adoption
- BUGs
  - How to submit bug reports for IBISCHK and TSCHK/TSCHK2
  - Summary of present BUGs considered for resolution
- Recent and Future Developments in IBIS
  - (Time index: 33:55)
  - Expanded system-level perspective
  - Power Integrity focused modeling
  - Multi-level analog buffer modeling
  - Interconnect modeling
  - Quality and Testing
  - Specification Clarification
  - What else should we be looking at? Bring your ideas!
- 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
- IBIS Website Resources
  - IBIS Summits
  - Task Group information
  - Member FAQ
  - Specification documents (IBIS and Touchstone)
  - BIRDs (IBIS), ISSIRDs (Spice), and TSIRDs (Touchstone)
  - Email support

  - Syntax parser downloads (IBISCHK for IBIS/IBIS-AMI and TSCHK for Touchstone)
  - Link: https://www.ibis.org

This concluded the Chair’s report.

## PRESENTATIONS:

### IBIS MODELING APPROACH FOR DESIGNS HAVING HIGH RON VARIATION WITH PROCESS

Rahul Kumar (STMicroelectronics, India)
Manish Bansal (STMicroelectronics, India)
Raushan Kumar (STMicroelectronics, India)
[Presented by Raushan Kumar]

(Start 00:46:50, To 01:00:40)

The presentation covered the following:

- Introduction
- Challenge
- Conventual buffer V/T data extraction
- Implemented V-T extraction approach
- Modification in IBIS table
- IBIS vs. SPICE matching results
- Three take-aways
- Discussion

### BRIDGING THE GAP: CORRELATING IBIS-AMI SIMULATIONS WITH POST-SILICON MEASUREMENTS FOR A 6.25 GBPS TRANSMITTER

Rahul Kumar (STMicroelectronics, India)
Manish Bansal (STMicroelectronics, India)
Anil Kumar Dwivedi (STMicroelectronics, India)
Kirtiman Singh Rathore (STMicroelectronics, India)
Rhani Menzer (STMicroelectronics, France)
[Presented by Rahul Kumar]

(Start 01:01:10, To 01:19:30)

The presentation covered the following:

- Introduction
- Design & model brief
- IBIS-AMI simulations
- Silicon measurements
- Results
- Conclusion
- Discussion

**POWER INTEGRITY MODELING IN IBIS**

Arpad Muranyi (Siemens EDA, USA)
Walter Katz (The Mathworks, USA)

(Start 01:19:35, To 01:59:52)

The presentation covered the following:

- Overview
  - Models that are required for a board level Power Integrity analysis
  - PI model has an interconnect model and a silicon load model
  - Three kinds of PI analysis, DC, AC and TD (Transient)
  - Interconnect model ports have groups of pin, and multiple current loads
  - Ground can be Floating or Node 0
  - Example of Power Integrity interconnect models and silicon load models in proposed format
- Discussion

**BREAK**

(Conclusion of Recording 1, start of Recording 2)

- Note: Time indices now reference Recording 2.
- For Recording 2, see Link: https://www.ibis.org/summits/may25/

**ATM TASK GROUP REPORT**

Arpad Muranyi (Siemens EDA, USA)
Chair, ATM Task Group

(Start 00:00:00, To 00:08:08)

The presentation covered the following:

- Introduction
- Progress Report
    - One BIRD approved since January 2025
    - No BIRDs rejected since January 2025
    - Pending BIRDs, BIRD drafts, potential discussion topics
    - Adding support for C-PHY in IBIS
    - Invitation for collaboration

### IBIS QUALITY TASK GROUP REPORT – IBISCHK8 SYNTAX PARSER

Randy Wolff (Siemens EDA, USA)
Chair, IBIS Quality Task Group

(Start 00:08:30, To 00:30:00)
The presentation covered the following:

- Introduction
- Manages IBISCHK and TSCHK parser testing and development
- Develops the IBIS Quality Specification
- How to get involved
- Update on IBISCHK8 Syntax Parser Development
- IBISCHK8 Parser Coverage
- IBISCHK8 Parser Requirements
- BIRD discussion
- BUG discussion
- General discussion

### IBIS INTERCONNECT TASK GROUP UPDATE: TOUCHSTONE 3.0 FEATURES & PROGRESS

Michael Mirmak (Intel, USA)
Chair, Interconnect Task Group

(Start 00:30:00, To 00:47:20)
The presentation covered the following:

- Introduction
- Current work
    - Touchstone 3.0 specification being prepared
    - TSIRDs being considered
    - Pole-Residue summary
    - Port-Mapping summary
    - Request to community for input
- Discussion

## IBIS-AMI MODELING FORMULATION FOR BI-DIRECTIONAL MULTI-GBASED-T1 AUTOMOTIVE ETHERNET LINKS

Fangyi Rao (Keysight Technologies, USA)
Zhiping Yang, (PCB Automation Inc. & MST EMC Lab, USA)
Saied Benyamin (Ethernovia Inc., USA)
Geoff Zhang (AMD, USA)
[Presented by Zhiping Yang]

(Start 00:48:00, To 01:22:17)

The presentation covered the following:

- Introduction
    - MultiGBase-T1 automotive ethernet
    - Bi-directional link and echo cancellation
- AMI Modeling and Simulation Approach for Bi-directional Links
- Simulation Examples
    - Cable model
    - Hybrid model
    - TX and RX models
    - Simulation results
- Discussion

## OPEN DISCUSSION - IBIS OPEN FORUM

(Start 01:22:20, To 01:32:50)

Doug Burns announced the conclusion of the papers and announced the start of open discussion.

- Note: See recording for Q+A discussion.

## CLOSING REMARKS

(Start 01:32:50, To 01:35:14)

Doug Burns thanked everyone for attending. Doug encouraged attendees to lobby their employers to join IBIS Open Forum as it is not expensive and enables access to various resources and input to the specifications regarding IBIS and Touchstone. Randy Wolff thanked Zuken for sponsoring and Markus Bücker from Zuken as well for hosting the IBIS summit in-person on-site. Markus Bücker thanked Zuken for sponsorship also. Doug also thanked Zuken for sponsoring. Doug announced the meeting was officially adjourned. The meeting adjourned.

## NEXT MEETING

The next IBIS Open Forum teleconference meeting will be held on May 16, 2025. The following IBIS Open Forum teleconference meeting is scheduled for June 6, 2025.

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## NOTES

Former CHAIR: Lance Wang

Acting CHAIR: Douglas Burns
vice-chair@ibis.org
CEO and Signal and Power Integrity Consultant, SI-Clarity, LLC.

SECRETARY: Graham Kus
graham.kus@ibis.org
Signal Integrity Engineer, NOKIA
1 Robbins Rd
Westford, MA 01886

TREASURER: Randy Wolff
randy.wolff@siemens.com
Product Architect, Siemens EDA

LIBRARIAN: Zhiping Yang
YangZhip@mst.edu

WEBMASTER: Steven Parker (845) 372-3294
sparker@marvell.com
Senior Staff Engineer, DSP, Marvell
2070 Route 52
Hopewell Junction, NY 12533-3507

POSTMASTER: Curtis Clark
curtis.clark@ansys.com
Ansys, Inc.
400 Fifth Avenue
Suite 500
Waltham, MA 02451

This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.
- To ask specific questions for individual response.
- To subscribe to or unsubscribe from the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org):
  - https://www.freelists.org/list/ibis
  - https://www.freelists.org/list/ibis-users

- To subscribe to or unsubscribe from one of the Task Group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, ibis-editorial@freelists.org, or ibis-quality@freelists.org:
    - https://www.freelists.org/list/ibis-macro
    - https://www.freelists.org/list/ibis-interconn
    - https://www.freelists.org/list/ibis-editorial
    - https://www.freelists.org/list/ibis-quality
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: ibischk7, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

The BUG Report Form for ibischk resides along with reported BUGs at:

https://ibis.org/bugs/ibischk/
https://ibis.org/ bugs/ibischk/bugform.txt

The BUG Report Form for tschk2 resides along with reported BUGs at:

https://ibis.org/bugs/tschk/
https://ibis.org/bugs/tschk/bugform.txt

The BUG Report Form for icmchk resides along with reported BUGs at:

https://ibis.org/bugs/icmchk/
https://ibis.org/bugs/icmchk/icm_bugform.txt

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

https://ibis.org/bugs/s2ibis/bugs2i.txt
https://ibis.org/bugs/s2ibis2/bugs2i2.txt
https://ibis.org/bugs/s2iplt/bugsplt.txt

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

https://ibis.org/

Check the IBIS file directory on IBIS.org for more information on previous discussions and results:

https://ibis.org/directory.html

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## SAE STANDARDS BALLOT VOTING STATUS (attendee X; absent -)

| Organization | Interest Category | Standards Ballot Voting Status | Mar 14, 2025 | April 4, 2025 | April 25, 2025 | May 14, 2025 |
|---|---|---|---|---|---|---|
| Altair | User | Inactive | - | - | - | - |
| AMD (Xilinx) | Producer | Inactive | - | - | - | - |
| Analog Devices | Producer | Inactive | - | - | - | X |
| Ansys | User | Active | X | X | X | - |
| Applied Simulation Technology | User | Inactive | - | - | - | - |
| Aurora System | User | Inactive | - | - | - | - |
| Broadcom Ltd. | Producer | Inactive | - | - | - | - |
| Cadence Design Systems | User | Active | X | X | X | - |
| Ciena | User | Inactive | - | - | - | - |
| Cisco Systems | User | Inactive | - | - | - | - |
| Dassault Systems | User | Inactive | - | - | - | - |
| GE Healthcare Technologies | User | Inactive | - | - | - | - |
| Google | User | Inactive | - | - | - | - |
| Huawei Technologies | Producer | Inactive | - | - | - | - |
| Infineon Technologies AG | Producer | Inactive | X | - | - | X |
| Intel Corp. | Producer | Active | - | X | X | X |
| Keysight Technologies | User | Inactive | - | - | - | - |
| Marvell | Producer | Inactive | - | - | X | - |
| MathWorks | User | Active | - | - | X | X |
| Micron Technology | Producer | Inactive | X | - | - | - |
| MST EMC Lab | User | Active | X | X | X | X |
| SI-Clarity | User | Active | X | X | X | X |
| Siemens EDA | User | Active | - | X | X | X |
| STMicroelectronics | User | Inactive | - | X | - | X |
| Synopsys | User | Active | X | X | - | X |
| ZTE Corp. | User | Inactive |  | - | - | - |
| Zuken | User | Inactive |  | - | - | X |

Criteria for SAE member in good standing:

- Must attend two consecutive meetings to establish voting membership.
- Membership dues current
- Must not miss two consecutive meetings (voting by email counts as attendance)

Interest categories associated with SAE standards ballot voting are:

- Users - members that utilize electronic equipment to provide services to an end user.
- Producers - members that supply electronic equipment.

General Interest - members are neither producers nor users. This category includes, but is not limited to, government, regulatory agencies (state and federal), researchers, other organizations, and associations, and/or consumers.