



The future of the global freight and logistics industry will be shaped during a 2-day online conference from 15<sup>th</sup> to 16<sup>th</sup> of June. A [PhD Colloquium](#) as a pre-conference event is foreseen on the 14<sup>th</sup> of June.

Improve freight transport and logistics efficiency and sustainability through an interconnected, interoperable and shared use of logistics networks is a great opportunity. The Physical Internet concept aims to get freight flows and logistics services as accessible and connected as information and services are over internet in both global and last mile. Physical Internet aims at asset sharing and flow consolidation on a massive scale supporting the brutal challenge of freight transport and logistics decarbonisation.

## Short introduction on the Physical Internet

The Physical Internet concept aims to get freight flows and logistics services as accessible and connected as information and services are over internet in both global and last mile. The Physical Internet (PI,  $\pi$ ) has opened a paradigm-breaking field encompassing the interconnectivity and interoperability of smart logistics networks, transportation systems, manufacturing systems and supply chains, enabling seamless open asset sharing and flow consolidation on a massive scale.

It aims to transform the way physical objects are moved, deployed, realized, supplied, designed and used all around the world to improve by an order-of magnitude the overall performance in terms of economic, environmental and societal efficiency and sustainability.

## Aim of the conference

The 8<sup>th</sup> Annual International Physical Internet Conference (IPIC) aims to provide an open forum for industry, innovators, researchers, government officials and citizens to introduce leading edge concepts, technology applications and methodologies for future interconnected logistics; to review the state-of-the-art technologies and latest projects, and to identify critical issues and challenges for future Physical Internet induced research, innovation, and implementation. Specifically, the conference focuses on insights for implementation steps of the Physical Internet in the different generations and time frames from next year to 2030.

## How will the Online Conference work?

- Accepted papers and practical presentations will be part of the conference sessions that will take place on the 15<sup>th</sup> – 16<sup>th</sup> of June in different timings depending on the authors country region. IPIC 2021 is expected to have: ASIA-EUROPE, US/CANADA-EUROPE and AUSTRALIA-EUROPE sessions. Eventually other regions sessions (e.g., US/CANADA-ASIA, etc.).
- All sessions will have a live Q&A interactive session with the authors after the presentations are shared.
- Recorded and pdf presentations (as well as full papers) will be available in the speaker's profile of the conference and registered participants will be able to interact with the authors bilaterally through the conference platform.
- Registered participants will be able to access and revisit all conference sessions and generated materials through a restricted area at [ALICE Physical Internet Knowledge Platform](#).

## Conference topics

### AREA 1. ALICE Physical Internet Roadmap Implementation and Generations. *NEW!*

This conference builds on previous efforts of the Physical Internet Community and ALICE [Roadmap on Towards the Physical Internet](#) and is looking for contributions addressing different generations of the roadmap implementations as well as applications or technologies supporting its implementations.

- *From Logistics Nodes to PI Nodes*
- *From Logistics Networks to Physical Internet Network*
- *Developing the System of Logistics Networks towards the Physical Internet*
- *Access and Adoption*
- *Governance*

### AREA 2. The topics you find in every IPIC conference are included here. *Some new too!*

- *Interconnected freight transport, logistics and supply networks*
- *Modularization*
- *Material handling*
- *Vehicles and transshipment technologies*
- *Last mile & City logistics*
- *Omnichannel & E-commerce logistics*
- *Systems and technologies for interconnected Logistics (3D printing/ Internet of things/ machine learning/ augmented reality/ big data/ artificial intelligence/ blockchain/ cloud computing, digital twins, collaborative decision making)*
- *New communication networks enabling interconnected logistics (5G)*
- *Business models for open & interconnected logistics*
- *Manufacturing networks and the PI*
- *Ports and hubs in the PI*
- *PI Impacts*
- *PI Fundamentals and Constituents*
- *PI Implementation and Governance*
- *PI Modelling and Simulation*
- *Autonomous logistics operations and systems (autonomous transport/drones/mobile logistics/robotics)*
- *Distributed Intelligence in Physical Internet*

## How can I actively contribute/present in IPIC 2021?

International Physical Internet Conference (IPIC) 2021 expects:

**Practical Developments:** If you are a company, a project, or a solution provider, or you have any practical development you would like to share, please contact the organizers at [ipic@etp-alice.eu](mailto:ipic@etp-alice.eu) with a draft presentation outline + references and anything you may have to convince us to get you in the programme!.

**Paper & poster contributions** in the following forms (more information below):

- a research paper/poster on, for example, conceptual research, assessment research, case study research, modelling and validation research.
- a white paper or case study describing an application in practice.
- a report/poster describing the results of novel applications and technologies or innovative ideas and positions resulting from a project jointly performed by an academic and industry partner.

**Presentation of PI publications.** If you have outstanding physical internet papers published in journals and you want to share and discuss main findings orally with your peers please contact the organizers at [ipic@etp-alice.eu](mailto:ipic@etp-alice.eu) with a copy of the paper so we get you in the programme!

**Start ups** which business model or value proposition is related to the Physical Internet may apply by **15<sup>th</sup> of April**.

**Practical presentations:** If you are a company, a project, or a solution provider, or you have any practical development you would like to share, please contact the organizers at [ipic@etp-alice.eu](mailto:ipic@etp-alice.eu) before **15<sup>th</sup> of April** with a draft presentation outline you would like to share + references and anything you may have to convince us to get you in the programme.

## The timetable for contributions is as follows:

|   |                          |
|---|--------------------------|
| <ul style="list-style-type: none"> <li>• Abstract submission:               <ul style="list-style-type: none"> <li>○ 200 words for posters*</li> <li>○ 1000 words for papers</li> </ul> </li> </ul> | 1 April                  |
| <ul style="list-style-type: none"> <li>• Abstract acceptance notification:</li> </ul>   | 14 days after submission |
| <ul style="list-style-type: none"> <li>• Applications to be reviewer</li> </ul>   | 1 April                  |
| <ul style="list-style-type: none"> <li>• Practical developments draft presentation</li> <li>• Start ups call candidature</li> <li>• Presentation of publications elsewhere</li> </ul>               | 15 April                 |
| <ul style="list-style-type: none"> <li>• Full paper and poster submission:</li> </ul>   | 10 May                   |
| <ul style="list-style-type: none"> <li>• Final pdf + recorded video presentation</li> </ul>   | 1 June                   |
| <ul style="list-style-type: none"> <li>• Revised paper and poster submission</li> </ul>   | 4 June                   |

# IPIC 2021 ANNOUNCEMENT CALL FOR CONTRIBUTIONS

Paper and Poster Submissions\* must be made on-line via:

<https://easychair.org/conferences/?conf=ipic2021>

## TRACK IPIC2021

Following the Contributions Templates and Guidance available at:

<https://www.pi.events/IPIC2021/call-for-contributions>

Please note that you must first register for an EasyChair account to be able to access the above link. First-time users, please visit EasyChair's "[How to make a new submission](#)" for an overview of the submission system.

## TEMPLATES FOR SUBMISSION

- [IPIC2021 Paper Abstract Template](#)
- [IPIC2021 Full Paper Template](#)
- [IPIC2021 Poster Abstract Template](#)
- [IPIC2021 Poster Template](#)

Practical Presentations Submission need to be sent in pdf to:

[ipic@etp-alice.eu](mailto:ipic@etp-alice.eu)

## Outreach

- The Proceedings papers are to be officially archived (with DOI), except if requested otherwise by the authors.
- Conference proceedings will be produced with the papers and poster contributions.
- All contents and sessions will be available online (restricted access to conference attendees) in the [ALICE Knowledge Platform](#) with unlimited time access (you may revisit parallel sessions) and allowing extended interaction beyond the conference duration. A specific section for IPIC2021 will be created.
- The best research papers will be targeted for extension toward publication in special issues of scientific journals:
  - Special Issue "*Distributed Intelligence in Physical Internet*" ([more information](#))

## Review process

All submitted papers will be evaluated with regards to their suitability for the conference, originality and technical soundness.

- Abstracts of Paper and Poster Submissions will be reviewed by the Scientific Committee.

# IPIC 2021 ANNOUNCEMENT CALL FOR CONTRIBUTIONS

- Authors of accepted abstracts of papers, posters and practical presentations will be invited to present them in related conference sessions.
- Research papers will be peer-reviewed by the Scientific Committee.
- Presentations of PI publications proposed will be directly invited to present if they are addressing conference topic(s).
- The organization committee will evaluate the proposed practical presentations and contribution/value added to the conference.

Should you like to **apply to review other authors contributions**, please contact us at [ipic@etp-alice.eu](mailto:ipic@etp-alice.eu) by **1<sup>st</sup> April** including a CV and the specific areas and topics included in the call for contributions you feel more comfortable to review.

## The contributions may be related, yet not limited, to the following Areas and topics:

### AREA 1. ALICE Physical Internet Roadmap Implementation and Generations.

We are particularly welcoming company, governments and all type of stakeholder's contributions that have assessed the [ALICE Roadmap Towards the Physical Internet](#) and generated their own roadmap in the field of action (See Annex 1).

- **From Logistics Nodes to PI Nodes.** In Logistics Nodes, goods are consumed, stored, transformed, or transhipped from one transport mode to another. Ports, airports, logistics hubs, terminals, distribution centres, warehouses, depots are examples of Logistics Nodes. The Physical Internet envisions the development of the Logistics Nodes into Physical Internet nodes in which the operations are standardised and the usage of a family of standard and interoperable modular load units from maritime containers to smaller boxes is extensive. Services in PI nodes are visible and digitally accessible and usable including planning, booking and execution operation. Contributions may focus in any of the roadmap generations:
  - G2. Open and Seamless nodes service offering
  - G3. Automated node service request and response
  - G4. Nodes interconnect across networks
  - G5. Autonomous PI nodes
- **From Logistics Networks to Physical Internet Networks.** Logistics Networks include Logistics Nodes as well as the transportation services connecting the Logistics Nodes and reaching to the destination. Logistics Networks are under the control of a single company either a shipper, a freight forwarder or a logistics service provider reaching their value chain (i.e., customers and suppliers). PI Networks are expected to build seamless, flexible and resilient, door-to-door services consolidating and deconsolidating all shipments within a logistics network in which all assets, capabilities and resources are seamlessly visible, accessible and usable to make the most efficient possible use of them. Contributions may focus in any of the roadmap generations:
  - G2. Operational/Synchromodality / Physical Intranets

- G3. Multiple shipment joint/split
  - G4. Sense and respond optimization of network flows
  - G5. Fully Autonomous PI Network services and operations
- **Developing the System of Logistics Networks towards the Physical Internet.** Includes individual logistics networks that are interconnected. Therefore, the assets, services and resources of the individual logistics networks can be accessed by all logistics networks owners. The System of Logistics Networks forms the backbone of the Physical Internet and requires secure, efficient and extensible services for the flow of goods, information and finances across logistics networks.
  - G2. Network to network connectivity
  - G3. Extended inter-network connectivity
  - G4. Scalable logistics networks interconnectivity
  - G5. Complete PI functionality and networks interconnectivity
- **Access and Adoption.** This area includes the main requirements to access the Physical Internet through a logistics network part of it. It also includes different steps and the mind shift required to adopt Physical Internet concepts.
  - G2. Sectoral, regional, seamless vertical PI demonstration
  - G3. Large-scale PI demonstrations
  - G4. PI expansion
  - G5. Everyone can access the PI
- **Governance.** Governance includes the developments needed to evolve the Logistics Nodes, logistics networks and the System of Logistics Networks into the Physical Internet, i.e. the rules defined by the stakeholders forming or using them as well as the trust building processes and mechanisms.
  - G2. Rules and governance for asset-sharing platforms
  - G3. Foundation of PI governance body;
  - G4. Industrial adoption of PI rules and models
  - G5. Stable PI rules and models

## AREA 2. The typical topics in IPIC conference are included here!

As novelty, we incorporate Digital Twins and 5G networks applications in freight transport and logistics and the usual topics:

- **Interconnected freight transport, logistics and supply networks**
  - Open and interconnected transportation, storage & distribution
  - Cross-chain control and collaboration, interconnected cockpits and control towers.
  - Logistics networks performance, impact assessment and resiliency.
  - Logistics asset sharing, flow consolidation and load optimization.
  - Interconnected ports and hubs.
  - Synchromodality

- Smart hyperconnected inventory deployment and management.
- Open and interconnected logistics services, cloud logistics services.
- **Modularization, handling, vehicles, transportation and transshipment technologies**
  - Transport vehicles, drones and AGVs for interconnected logistics.
  - Innovative Transportation modes and the Physical Internet (Pipelines, Hyperloop, etc.)
  - Handling and transshipment autonomous operations and systems.
  - Packaging container design and engineering;
  - Modularization and standardization;
  - Smart, active, intelligent containers, boxes and logistics units;
- **Last mile & city logistics**
  - Interconnected city logistics,
  - City hubs
  - City regulations in support of physical internet
  - Modularization, boxes and handling units for city delivery.
  - Autonomous logistics systems in cities
  - Physical Internet & e-commerce
- **Omnichannel & e-commerce logistics**
  - Fulfilment strategies in meshed distribution networks
  - Crowdsourced delivery and transportation.
  - Physical Internet based retail networks
- **Systems and technologies for interconnected Logistics**
  - 3D printing, Internet of things, machine learning, augmented reality, big data, artificial intelligence, blockchain, cloud computing, Digital twins, Collaborative decision making
  - Autonomous logistics operations and systems: autonomous transport, drones, mobile logistics, robotics...
  - Supply chain visibility: tracking, tracing, sensing, event management and prediction, asset monitoring.
  - Novel ICT platforms enabling interconnected logistics and access to cloud logistics services.
  - Digital ecosystems and information sharing for freight transport and logistics (e-freight, e-booking, e-CMR...)
  - New communication networks enabling interconnected logistics (5G)
- **Manufacturing networks and the Physical Internet**
  - Modular and agile production, manufacturing and distribution networks.
  - Physical Internet responsive to Industry 4.0 paradigm.
  - Customer centric manufacturing and distribution.
- **Business models for Open & Interconnected logistics**
  - Business models, revenue models and profit models in hyperconnected logistics
  - Liability and insurance responsibilities.
  - Hyperconnected business model innovation.
  - Business models and cases to build networks of networks.
  - Business models promoting openness of proprietary logistics networks and resources.
- **Physical Internet Impacts**

- Contributions to COP 21 emissions objectives.
- Energy reduction and decarbonization of freight transport and logistics.
- End-to-end carbon footprint measurement, indicators and assessment of (policy/industry) practices, etc.
- Implications for the circular economy: PI as part of the circular economy, waste avoidance and resource efficiency.
- Implications for congestion and infrastructure.
- Other societal impacts.
- **Physical Internet Fundamentals and Constituents:**
  - Physical Internet frameworks & protocols
  - Efficiency, sustainability, resilience, security, adaptability, agility of the Physical Internet
  - PI network design.
  - Liability and insurance models in the PI
  - Container and logistics units design & engineering.
  - Design, engineering, planning and operation of handling, storage, transportation technologies, systems, facilities and infrastructures in the Physical Internet.
  - Mobility web, distribution web, realization web, supply web and service web
  - PI hub design & engineering: Hub definition, services and publications
  - Physical Internet access.
  - What can PI learn from other networks of networks: Telecom, Postal, Energy, Digital Internet?
  - Decision and support models in the Physical Internet
- **Physical Internet Implementation and Governance:**
  - Physical Internet implementation drivers and issues
  - Stakeholders and their roles in the Physical internet
  - Stakeholder incentives for PI adoption and implementation
  - Negotiation, collaboration and conflict resolution within Physical Internet
  - Social innovation and new ways of working in the Physical Internet
  - Impact of regulatory innovation on PI
  - Impact of PI induced innovation on regulation, taxation and duties
  - Design of the Physical Internet governance structure and processes
  - Physical Internet Roadmaps
  - Mindset, collaboration and openness, behavioural aspects.
- **PI Modelling and Simulation**
  - Novel descriptive, predictive and prescriptive analytics;
  - PI modelling, simulation,
  - Optimization and gaming approaches for Physical Internet
  - Qualitative and quantitative methodologies for studying proposed or existing PI induced systems, processes, phenomena & business models
- **Distributed Intelligence in Physical Internet. *NEW!*** This topic is linked to the Special Issue "Distributed Intelligence in Physical Internet" ([more information](#)). Special issue editors are among the Scientific Committee and will invite promising IPIC contributions to contribute to the special issue.
  - Applications of digital technologies in smart supply chains;



# IPIC 2021 ANNOUNCEMENT CALL FOR CONTRIBUTIONS

- Real-time decision-making related to fulfilment and delivery performance;
- ML and AI tools for demand forecasting and inventory control;
- Deployment of fog and edge computing for intelligence distribution in PI-hubs
- Data-driven revenue management and pricing;
- ML and AI for freight transportation optimization;
- Development of intelligent logistics services;
- Autonomous logistics systems
- Machine learning for logistics service development;
- Technologies for autonomous delivery vehicles;
- AI-powered visual inspection for warehouse and distribution operations;

For more information, please contact us via [ipic@etp-alice.eu](mailto:ipic@etp-alice.eu)

## Possible evolutions in the different areas and generations

# PHYSICAL INTERNET

