PhDs Rail Webinar

Academics4Rail PhDs EU-Rail

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Online Webinar 10.02.2026

Academics4Rail & PhDs EU-Rail

Webinar Report: Academics for Rail & PhD4Rail Projects

Presentations by 16 Early-Stage Researchers – February 10, 2026

Link to all presentations

Executive Summary

On February 10, 2026, EURNEX (European Rail Research Network) hosted a webinar showcasing progress from 16 PhD researchers funded under the *Academics4Rail* (6 PhDs) and *PhDs EU-Rail* (10 PhDs) projects, both supported by the Europe Rail Joint Undertaking. The presentations highlighted remarkable diversity across technical, operational, social, and environmental dimensions of railway research, demonstrating strong industry collaboration and tangible pathways to implementation. This report synthesizes key advances from each researcher and captures transversal insights from EURNEX Secretary General Armando Carrillo.

PhD Research Highlights

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#	Researcher (Institution)	Core Focus	Key Advances
1	**Luca Corniani** (Politecnico di Milano)	Aerodynamics of freight trains	Developed open-access geometry database for freight vehicles; completed sensitivity analyses for CFD guidelines; validated simulations using real train compositions from HUPAC; targeting 4 journal publications including experimental validation with DLR.
2	**Javier Gómez Fernández** (UPM, Spain)	EMC in AC electrification systems	Created configurable simulation tool to assess EM interference between high-speed and commuter lines; validating against field measurements with Adif, Siemens, and Alstom; addressing EN

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			50121/50122 compliance for contact voltage and signaling systems.
3	**Jon Hernández Martínez** (Univ. Basque Country)	Additive manufacturing for wheel profiling	Demonstrated feasibility of directed energy deposition (laser) to extend wheel service life; conducting tribological testing at University of Pardubice; targeting material optimization and economic analysis for specific railway lines.
4	**Getachew Hagos Geleta** (Univ. Gustave Eiffel)	Wireless communication for virtual coupling	Developed dependability framework for 5G sidelink in train platooning; performed fault tree analysis and CPN modeling of cooperative awareness messages; won best paper awards at RSS Rail and Smart Rail conferences.
5	**Taoufik Najeh** (Luleå Univ. of Technology)	PHM for switches & crossings	Deployed FBG optical sensors for multi-purpose monitoring: temperature control, foreign object detection, and ballast deficiency assessment; collaborating with Trafikverket (Sweden); addressing sensor packaging challenges for harsh environments.
6	**Jean-Valentin Merlevède** (France)	Human-machine collaboration in automated driving	Defined operational/tactical automation grades beyond classic models; developed "digital co-driver" framework with physiological monitoring (heart rate, pupilometry) to adapt assistance based on driver state; planning validation on full-scale simulator (SHEET platform).

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7	**Oleksandr Rohovyi** (Nat. Transport Univ., Ukraine)	Rail decarbonization mechanisms	Developed multi-criteria decision framework (AHP/TOPSIS) integrating LCA for technology ranking; engaged Ukrainian Railways and LTG Group on renewable diesel pilots; addressing barriers: business case weakness, certification complexity, and data scarcity.
8	**María José Bermejo** (Univ. of Málaga)	Gender equality in rail	Designed comprehensive questionnaire (with UIC/Siemens Mobility) to assess gender gap among workers and users; planning Paris workshop (Sept 2026) on attracting female talent; first paper published in *Traffic and Transportation Engineering*.

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9	**Prachiti Shinde** (Aston Univ., UK)	Next-gen rail education	Developed AI-driven curriculum evaluation tool to bridge industry-education gap; collaborating with Network Rail and UIC on workforce capacity building; targeting European harmonization framework for rail training standards.
10	**Ampong Dominic Kwakye** (Univ. of Pardubice)	Rail-enabled urban logistics	Designed "shared capacity rail" model connecting regional freight with urban micro-hubs and zero-emission last-mile delivery; developing interactive best-practices map; seeking international cooperation for ETS2 impact assessment.
11	**Helena Luketić** (Univ. of Zagreb)	Night train passenger experience	Investigating "hotel on wheels" concept for luxury overnight services; analyzing service parameters through hotel management parallels; preparing TRA 2026 presentation on passenger experience and sustainability trade-offs.
12	**Marco António** (Univ. of Porto)	Train-bridge interaction standards	Reassessed EN 1990 lateral vibration criteria (1.2 Hz rule) as overly conservative using TTBI simulations; benchmarking deflection limits against modern comfort standards; collaborating with Infraestruturas de Portugal and Adif.
13	**Bekir Arslan** (TU Berlin)	Human factors in digital command	Scientifically accompanying DB's digital command rollout; developing experimental setup integrating interlocking systems with train simulators; preparing empirical studies with dispatchers/drivers to evaluate new interfaces.
14	**David Pierce** (Univ. of Leeds)	Societal impact assessment framework	Developing methodology to translate 70+ technical KPIs from flagship projects into societal benefits (mode shift, emissions, costs); addressing limitations of Shift2Rail framework by modeling pan-European impacts over 30-year horizon.
15	**Apolline Bruyère** (Univ. of Lille)	Accessibility for passengers with intellectual disabilities	Conducting field observations and co-design workshops with SNCF/Alstom; developing good-practices protocol based on real travel experiences; addressing staff training needs and information comprehensibility.
16	**Domenico Uomo** (Italy)	ICT platform for next-gen ERTMS	Designed hybrid microservice architecture (RTOS + containers) for ERTMS applications; developing AI models for on-board positioning anomaly detection (uncertainty and wrong position);

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			targeting explainable AI for safety-critical contexts.

Transversal Observations from EURNEX Coordinator

Armando Carrillo, Secretary General of EURNEX and project coordinator, emphasized several strategic priorities shaping these initiatives:

1. **Scientific Production as Core Deliverable**: Europe Rail Joint Undertaking explicitly links funding to measurable scientific output. All 16 PhDs demonstrated strong publication pipelines (Q1/Q2 journals, TRA 2026, TransBaltica), reflecting a deliberate shift toward evidence-based rail research in Europe.
2. **Industry Integration as Non-Negotiable**: Each PhD maintains active collaboration with infrastructure managers (Adif, Infraestruturas de Portugal), operators (SNCF, DB), and manufacturers (Siemens, Alstom). This ensures research addresses real operational constraints and accelerates technology transfer.
3. **Interdisciplinarity as Competitive Advantage**: The portfolio spans computational fluid dynamics to gender studies, proving rail's complexity demands convergence of engineering, social sciences, and policy analysis. This breadth strengthens Europe's capacity to tackle systemic challenges like decarbonization and digitalization.
4. **Network Building Beyond Individual Projects**: Through transversal activities, EURNEX is mapping Europe's entire PhD landscape in rail research to identify thematic clusters, capability gaps, and collaboration opportunities—directly informing the next EU Framework Programme's rail research agenda.
5. **Strategic Dissemination Pathways**: Upcoming milestones include dedicated night train sessions at TRA 2026 (Budapest) and an EURNEX physical meeting at UIC (Paris, September 29–30, 2026), designed to connect researchers with industry decision-makers during InnoTrans.

Conclusion

These 16 PhD projects exemplify a new paradigm in European rail research: deeply collaborative, industry-grounded, and strategically aligned with EU transport policy objectives (decarbonization, digitalization, inclusivity). By simultaneously advancing technical frontiers and addressing human-centric challenges—from virtual coupling safety to intellectual disability accessibility—the cohort is building the scientific foundation for a resilient, sustainable, and equitable rail system. EURNEX's coordination ensures these individual efforts coalesce into a cohesive European research ecosystem capable of shaping global rail innovation for the next decade.