

Title: Accelerating Discovery: Mapping the Future of AI-Enhanced Theoretical Physics

Speakers: Axton Pitt

Collection/Series: Theory + AI Symposium

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Abstract:

This talk explores how artificial intelligence could transform theoretical physics over the next 25 years by addressing the crucial challenge of navigating an increasingly complex scientific literature landscape. We introduce Litmaps, a platform leveraging AI and visualization techniques to accelerate literature discovery and insights.

We illustrate Litmaps' current capabilities in rapidly identifying relevant connections and advancing theoretical research. We also outline critical engineering challenges, including open access to historical literature, data standardization, and managing uncertainty in AI models.

Finally, we highlight the importance of collaboration among physicists, AI researchers, engineers, and entrepreneurs, to realise the AI-enhanced future of theoretical physics research.

Accelerating Discovery: Mapping the Future of AI-Enhanced Theoretical Physics

Theory + AI Symposium
Perimeter Institute



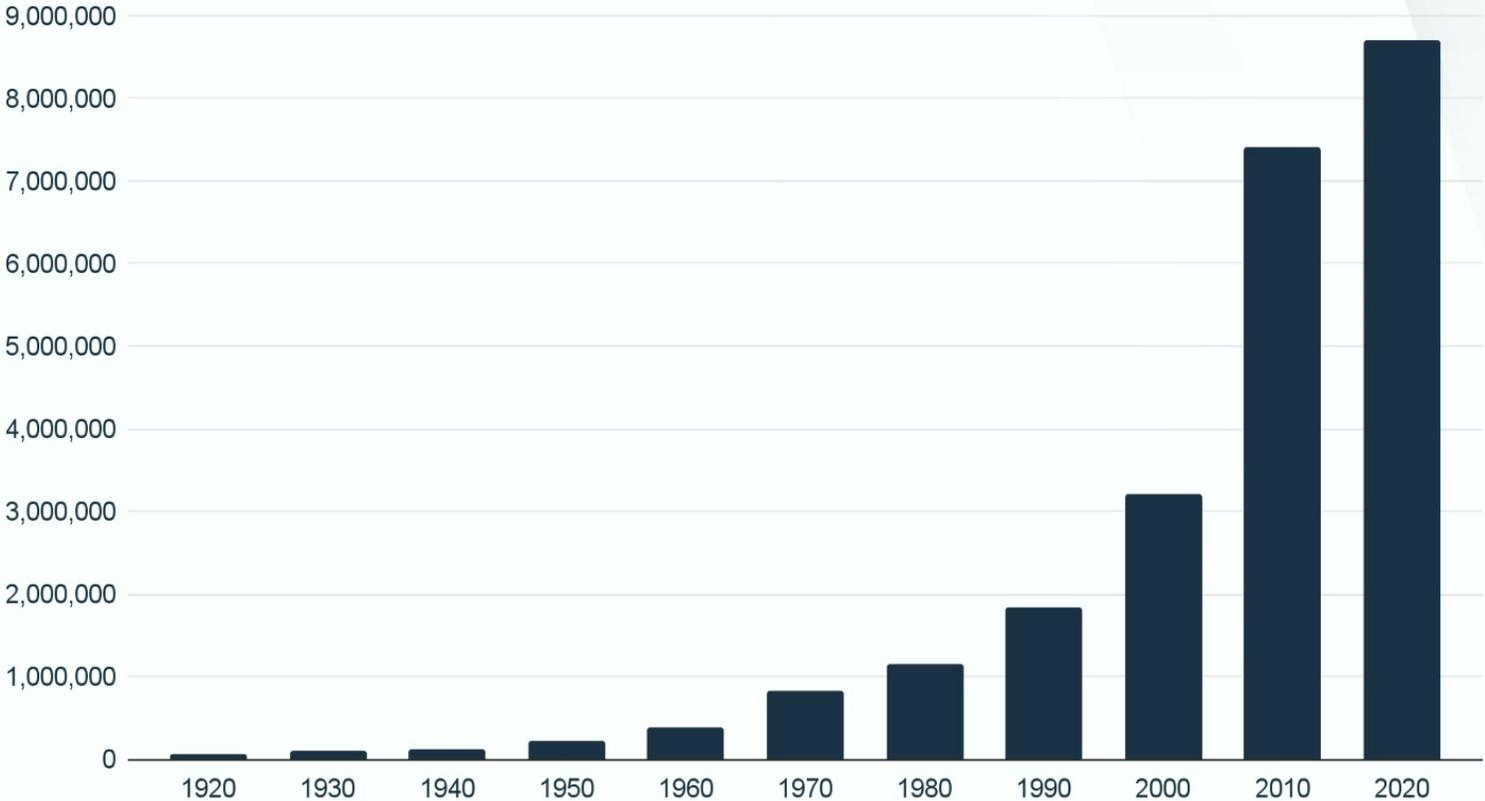
Axton Pitt
Co-founder and CEO



In 25 years, AI may solve complex physics problems — but can we point it to the right questions?



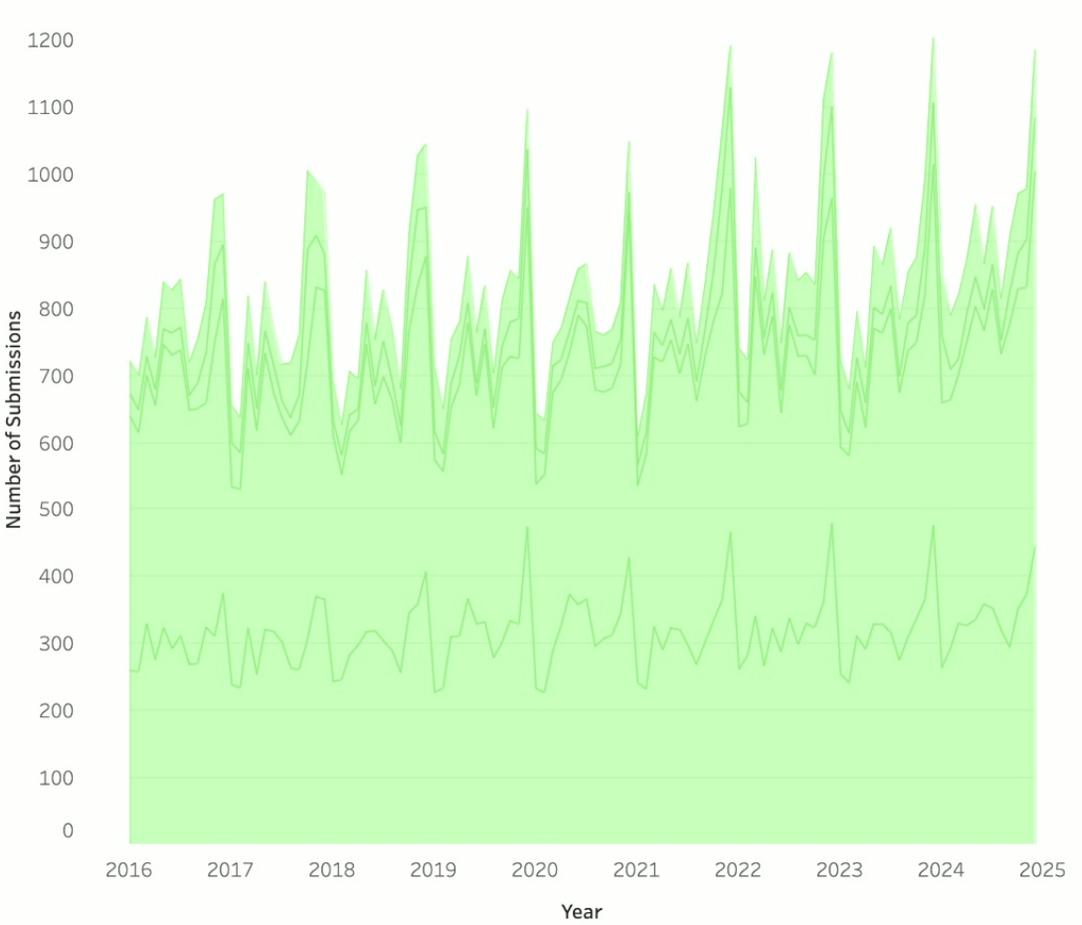
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Literature Discovery



Bottleneck: Inefficient discovery and synthesis processes — humans can't scale rapidly.

peroxiredoxin



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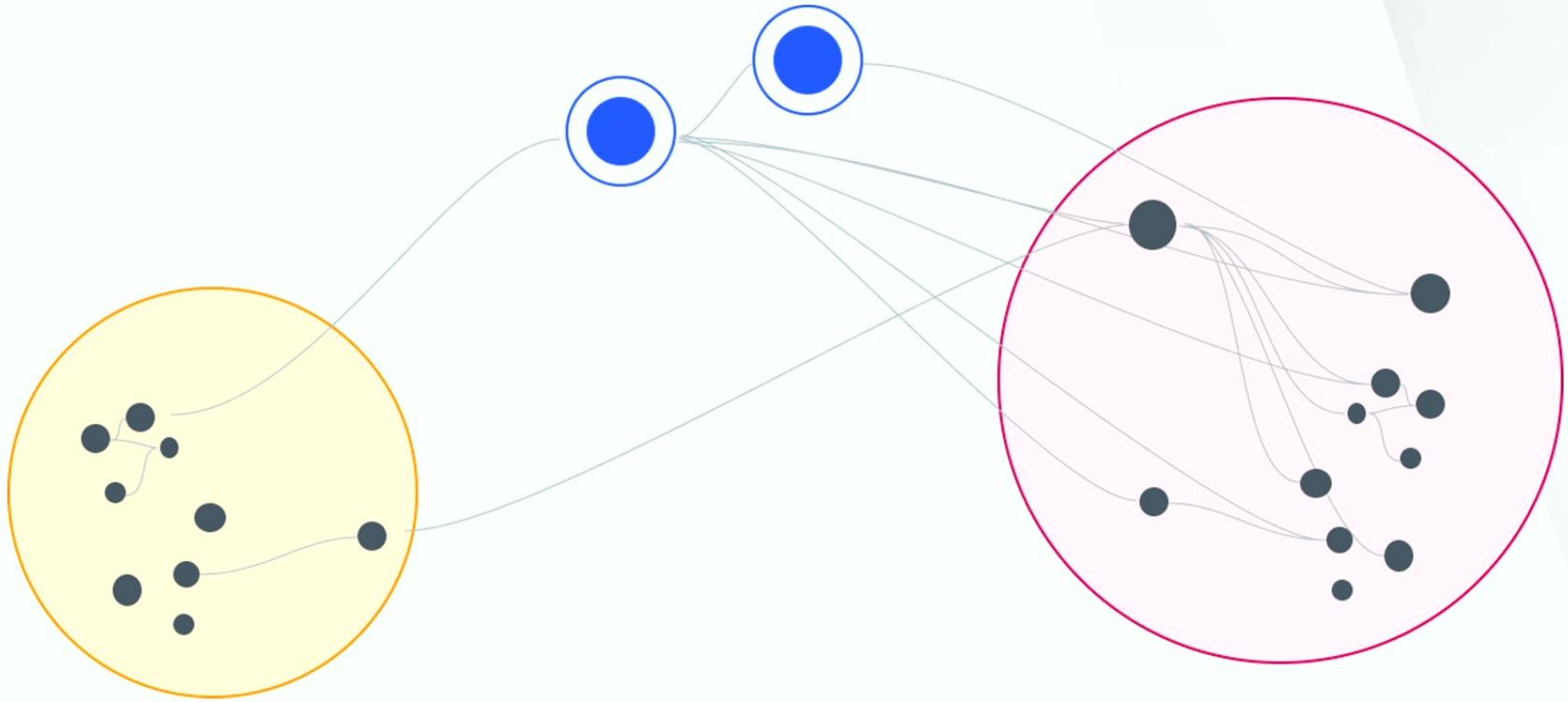
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Challenges

- **Open Access to full text literature beyond recent years**
- **Extracting data from PDFs**
- **Standardization and interoperability of literature databases**
- **Handling inconsistencies in literature-based AI models outputs**
- **Building user interfaces help humans get the most out of AI breakthroughs**



The Next 25 Years

- Personalized Recommendations
- AI-generated summaries of research gaps
- Partnering with AI Agents
- Structured Literature History



Collaboration Required!

- **Physicists to define key questions and validate quality.**
- **AI researchers and engineers to build robust, interpretable models.**
- **Entrepreneurs and toolmakers (like Litmaps) to deliver scalable infrastructure and user interfaces.**



Litmaps Today

- **100,000+ of researchers using our product monthly**
- **Integrations with other tools in the ecosystem (e.g. Zotero, PaperPile, and arXiv)**
- **Emerging capabilities (e.g., embedding-based semantic search, network analysis).**
- **Large Language Model insights beginning to be integrated, and results cross-referenced with Litmaps corpus**



Thank you!