

Curiosity, Chocolate & AI

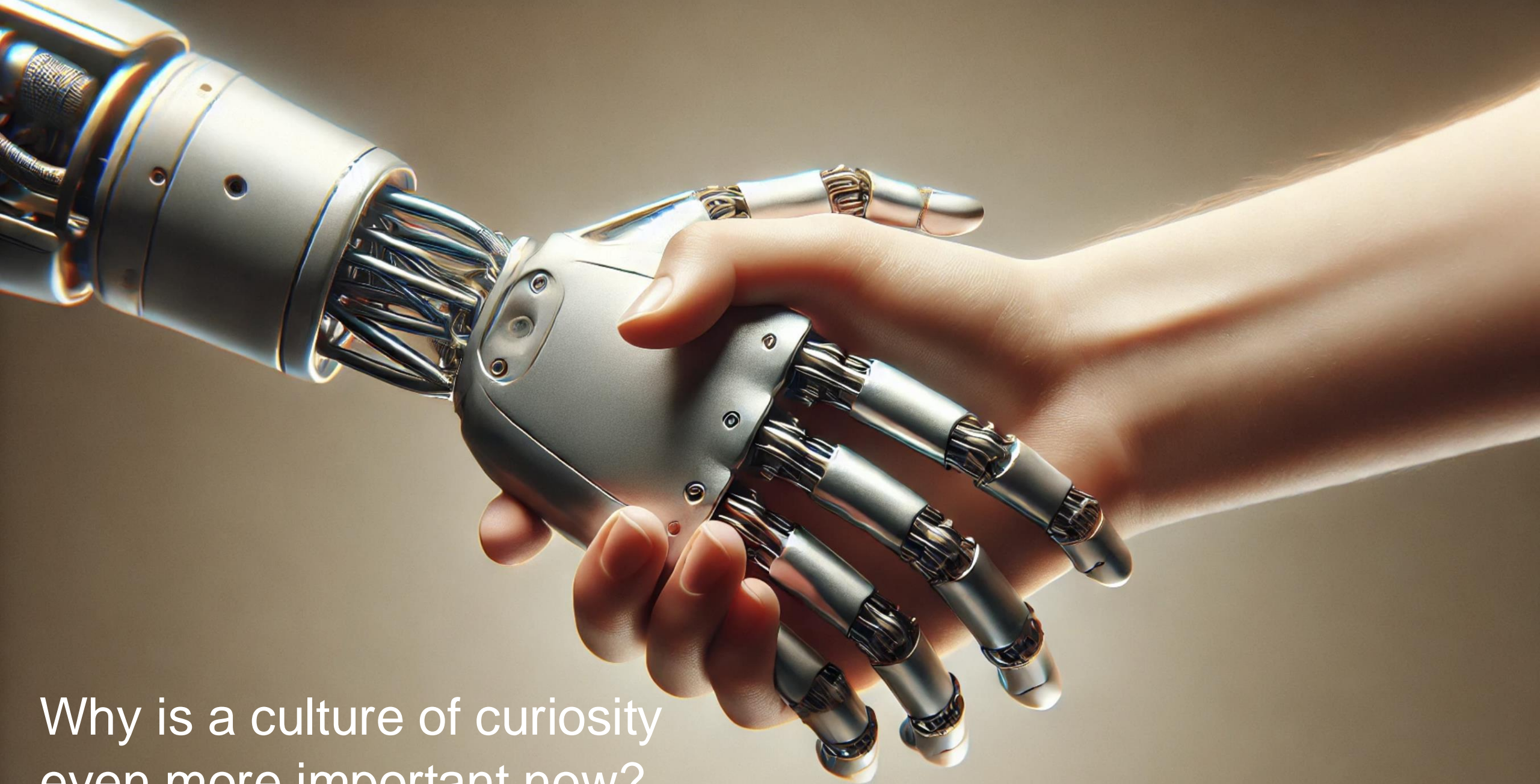
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Our Agenda

- Why does curiosity matter?
- AIP Publishing: A case study

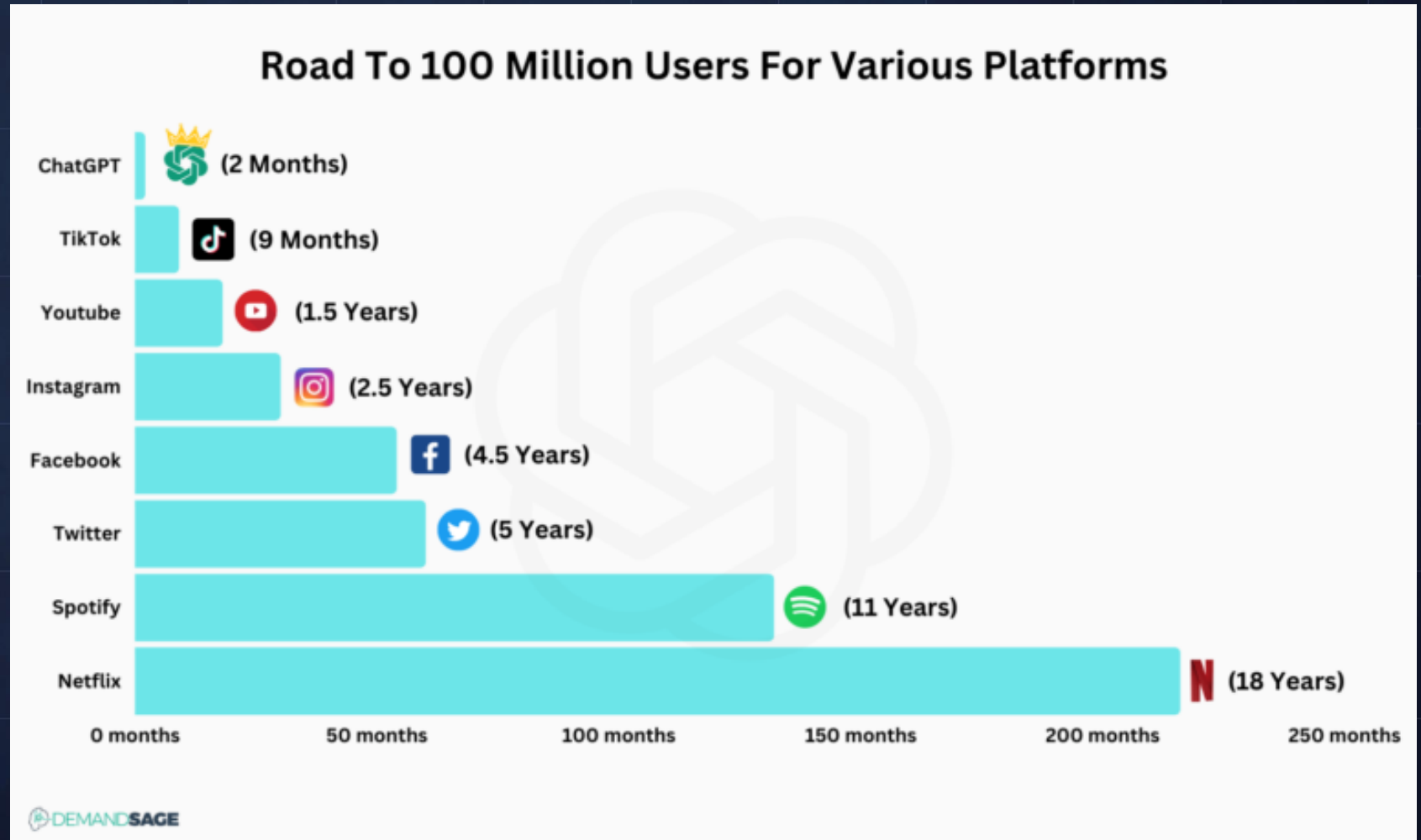


Why is a culture of curiosity
even more important now?

Generative AI:

Record Setting Uptake

- 1m in 5 days
- 100m /month
in 2 months
- 400m users
February 2025



Why does curiosity matter for Gen AI?

One Useful Thing

Latent Expertise: Everyone is in R&D

Ideas come from the edges, not the center



ETHAN MOLLICK

JUN 20, 2024

We need to figure it out together because there is nobody else who can. The AI labs themselves don't know what they have built, or what tasks LLMs are best suited for. Bad actors will find bad uses for AI regardless of what we do. We need to work at least as hard to not just mitigate the damage they will do, but also to find good uses that help humans thrive using these new tools. Sharing what we learn, and what works, is a good way to start.

<https://www.oneusefulthing.org/p/latent-expertise-everyone-is-in-r>



***Do you feel confident in your
organization's ability to thrive in a
changing world?***

Why or why not?

AIP Publishing: Our AI approach



AIP Publishing

- Forums for discussion
- Spaces for exploration
- Structured goals
- Partners to expand expertise & scale
- Technology and thought partners



purposeledpublishing.org

IOP Publishing | APS | AIP Publishing



Currently >20% of the org has joined our “AI Exploration” Chat



Started with an
AI Sandbox




Grounded AI

AI working group and forums

- Organically formed and grown to include ~ 23% of us!
- Motivated by curiosity and learning opportunity
- Cross-team collaboration
- Sharing insights, industry news, experiments



The Sandbox: ChatAIPP








AIP


AI Informed Search - Beta


+ New Chat

Older

- what instruments were used in the paper Formation of metal-... 
- what instruments were used in the research for the paper Absorption... 
- Where was the research performed for the paper Surface and functio... 
- what instruments are mentioned the ~~near Surface and functional~~ 


 Help & FAQ

 Logout




AIP

AI Informed Search - Beta

Ask a question 


Powered by Mathison AI



Examples

How have machine learning methods been used in the field of thermal transport?


Write a short essay of three paragraphs on Facilitated diffusion



Capabilities

Remembers chat history.

Allows user to provide feedback on responses.



Limitations

May occasionally generate incorrect information.

May occasionally produce harmful instructions or biased responses.

Developing and assessing AI use cases

Based on the ChatAIPP exploration we developed more than three dozen potential use cases.

- What is the potential ROI in terms of researcher impact, efficiency or new product development?
- Is there a particular content or user need that is unique to AIP Publishing that would be served?
- Is this a service that is best delivered across many publishers by a platform vendor? Is it already offered?

Narrowed the list of use cases

1. Summarization (including summaries for K-12 audience)
2. Conversational search
3. AI-based article metadata tagging
4. Related paper finder
5. Article insight mining for intelligence products
6. Trend analysis including 3D trend visualization
7. Language services including article translation
8. Citation network analysis and collaboration recommendations
9. Article manuscript plugin for reference recommendation
10. Article commissioning toolset
11. Peer review finder
12. Reproducibility analysis
13. Pre-review article assessment
14. Submission/transfer guide for article-journal fit
15. Internal information concierge / business intelligence

Narrowed the list of use cases

AIP Publishing
Development = ourselves
and/or with partners

Scholarly Publishing
Vendor = we buy a
solution

AIP Publishing Development

- Article mining for intel products
- Peer review assistant
- Trend analysis
- Metadata tagging
- Article commissioning
- Reproducibility analysis

Scholarly Publishing Vendor Development

- Summarization
- Conversational search
- Related paper finder
- Language services
- Citation network analysis
- Article drafting plugin for reference recommendations
- Reviewer Finder

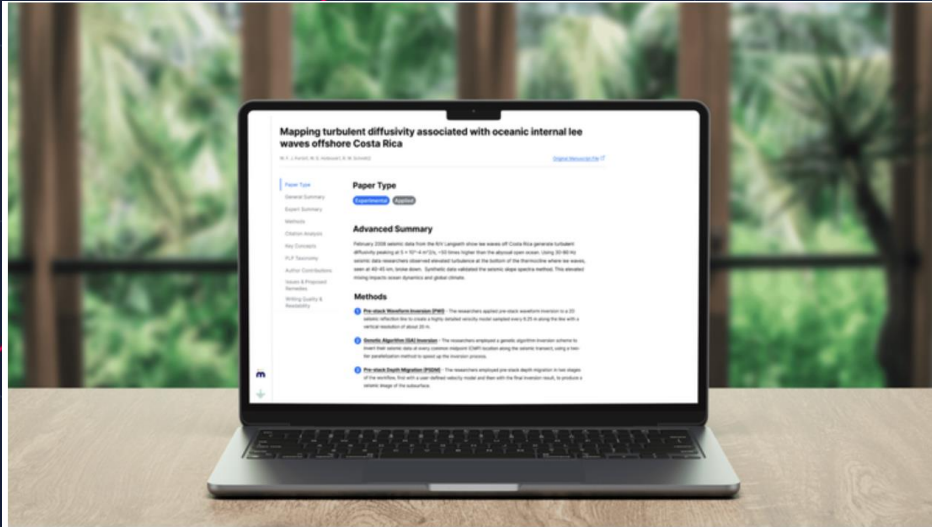


So... where are we now?

What did we build? What did we buy?
What's in the works?



Peer Review Assistant Prototype



PRA Prototype

From Manuscripts to Insights: Exploring the Future of Peer Review



Ann Michael
Leader in organizational growth

March 10, 2025

What would peer review look like if AI handled the admin, and humans handled the science?



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CULTURE & NEWS

Hum Launches Alchemist Review, an AI-Driven Peer Review Solution

3 min read • Laura Simis • Mar 11, 2025



Grounded AI

Peer Review Assistant Principles

- Focus on objective guidance
- Require a human to make all decisions and other judgment calls about the quality and value of the MS and its components.
- Focus features on areas where our content creates physical sciences specific expertise.

Peer Review Assistant

Proof of Concept and Prototype

In priority order, these are the capabilities we are exploring for a prototype:

1. Provide editors and peer reviewers with a **safe space** to upload manuscripts:
 - a. Generate a manuscript **summary and highlight key claims**
 - b. Upload a draft peer review for language polishing
2. Analyze **Citation/references**, providing feedback on their efficacy and suitability
3. **Extract Methods** and provide a high-level assessment

Peer Review Assistant

*UNDER CONSTRUCTION:
Citation Analysis Summary*

Citation Analysis

- Potential issues associated with author identity or track record.
- Citation usage may have some issues (20% red, 16% amber). Please review.
 - Total In-Text Citations Analyzed: 88
 - Citation Verified: 28
 - Match Found (Relevance Unverified): 16
 - Source Not Found: 14
 - Citation Relevance Unclear: 11
 - **Note:** A significant number of citations could not be located ("Source Not Found"), which may indicate issues with the provenance or quality of the paper or its citations, such as missing or mismatched metadata.
- No significant issues with overrepresentation.
 - **Author Representation:** The references include 234 unique author names, with the most frequently referenced author, Yanlong Li, appearing in 3 papers (~6% of total cited works).
 - **Journal Representation:** The references come from 25 unique journals, with the most frequently cited journal appearing in 5 papers (~13% of total cited works).
- A notable proportion of older papers cited.
 - **Recency Analysis:** Out of 40 papers analyzed, 11 (27.50%) were published within the last 5 years, indicating that the majority of citations are from older sources.

Peer Review Assistant

UNDER CONSTRUCTION: Methods Extraction

Methods

1. Assessment of the Homogeneous-to-Heterogeneous Flow Transition - This method was used to determine the point at which a fluidized bed of particles transitions from a homogeneous to a heterogeneous flow state, characterized by the formation of distinct layers or phases within the bed.
2. Force Balance Analysis - This method was used to analyze the balance of forces acting on a particle in a fluidized bed, including drag, lift, buoyancy, and gravity forces, to derive an expression for the resulting force acting on a particle.
3. Two-Layer Flow Model - This method was used to describe the flow behavior of the bearing-clayey-silt gas hydrate rock particles in a horizontal tubing, assuming a fluid system with two distinct layers: an upper layer with suspended particles and a lower layer with settled particles.

More AIPP AI Experimentation and Use

- Product Innovation – extracting information (e.g., lab equipment) from manuscripts and 2-3 other experiments
- Operational Impact – AI-powered chatbot within Microsoft Teams to streamline IT support and reduce repetitive helpdesk inquiries
- Publishing Workflow – Tools in production as well as Reviewer Finder tool



**AIP
Publishing**





**And none of it would work without
deep, intentional, (almost obsessive)
CURIOSITY!**



Final thoughts

- AI is the great equalizer – we ALL know almost nothing about it – and its potential impact – regardless of career stage or position
- AND because no one has the answers – we are all in this together – everyone in this room and beyond!



Comments & Questions



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