

## **Neuromorphic Computing**

Spiking Neural Networks and Beyond

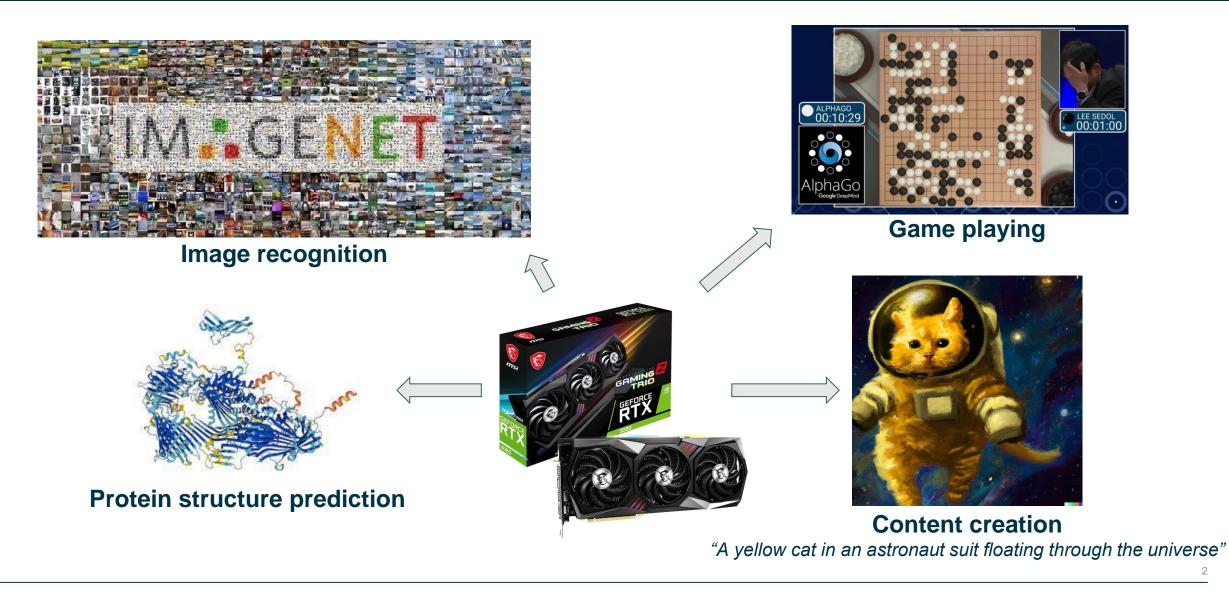
Alexander Hadjiivanov Dominik Dold Ren ADVANCED CONCERT BUT

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→ THE EUROPEAN SPACE AGENCY

## The recent (ongoing) Al revolution





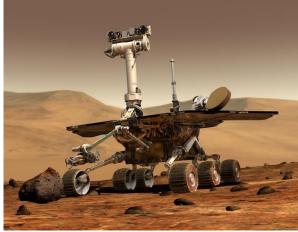
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## Al: a key technology for space?







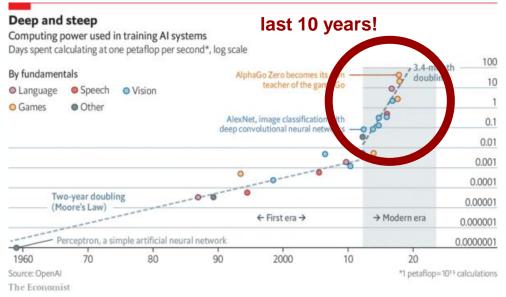


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## The tip of the iceberg: problems under the surface...



### **Power hungry**





Data hungry

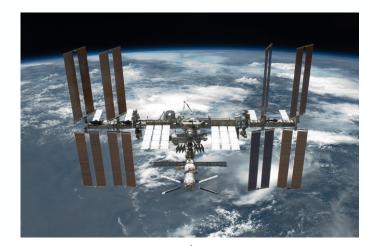
#### **Static & specialized**



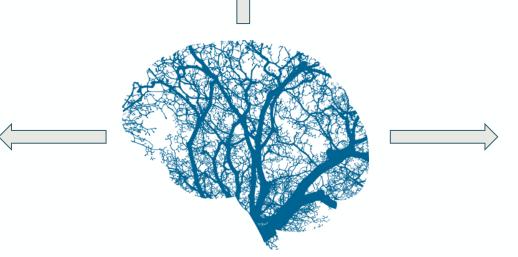
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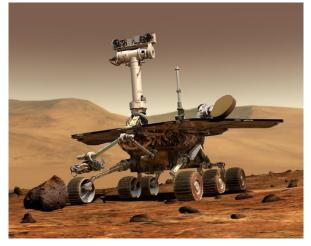
## Back to the drawing board: brain-inspired Al for space







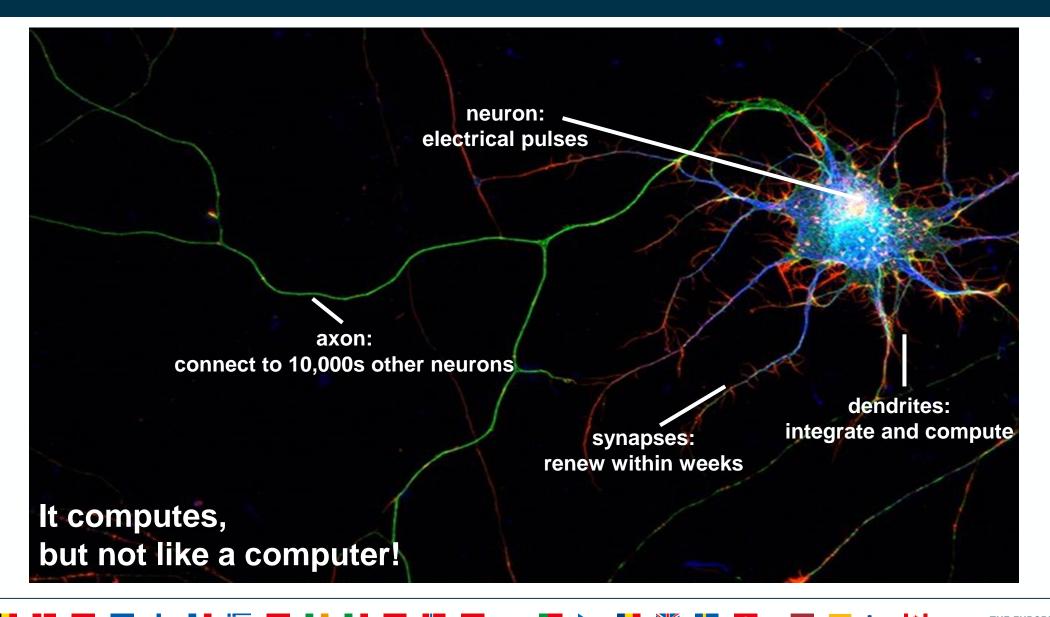




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## **Efficient AI: a question of architecture**





## A new paradigm: computing like the brain

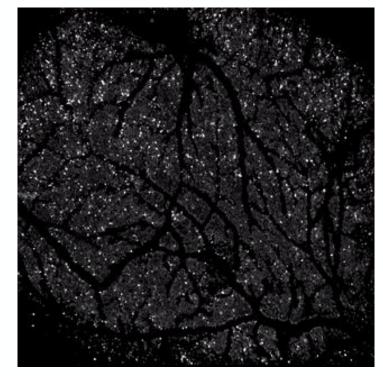




Adaptive



Robust



Dynamic





**Power-efficient** 

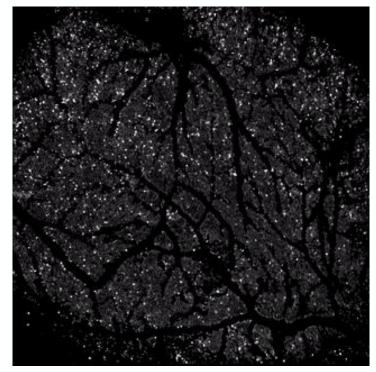


## **Continual learning to adapt to novelty**





Adaptive Robust









**Power-efficient** 

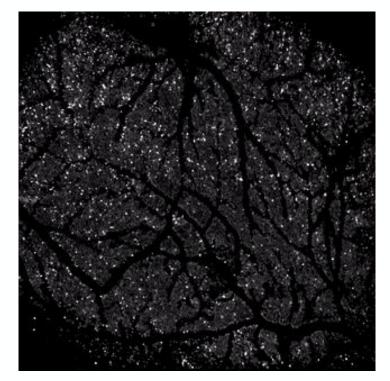


## **Sparse computing for sparse resources**



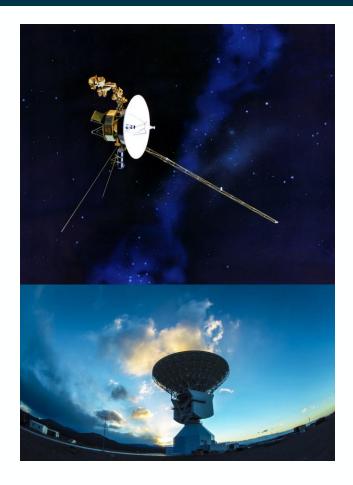


Adaptive Robust



Dynamic

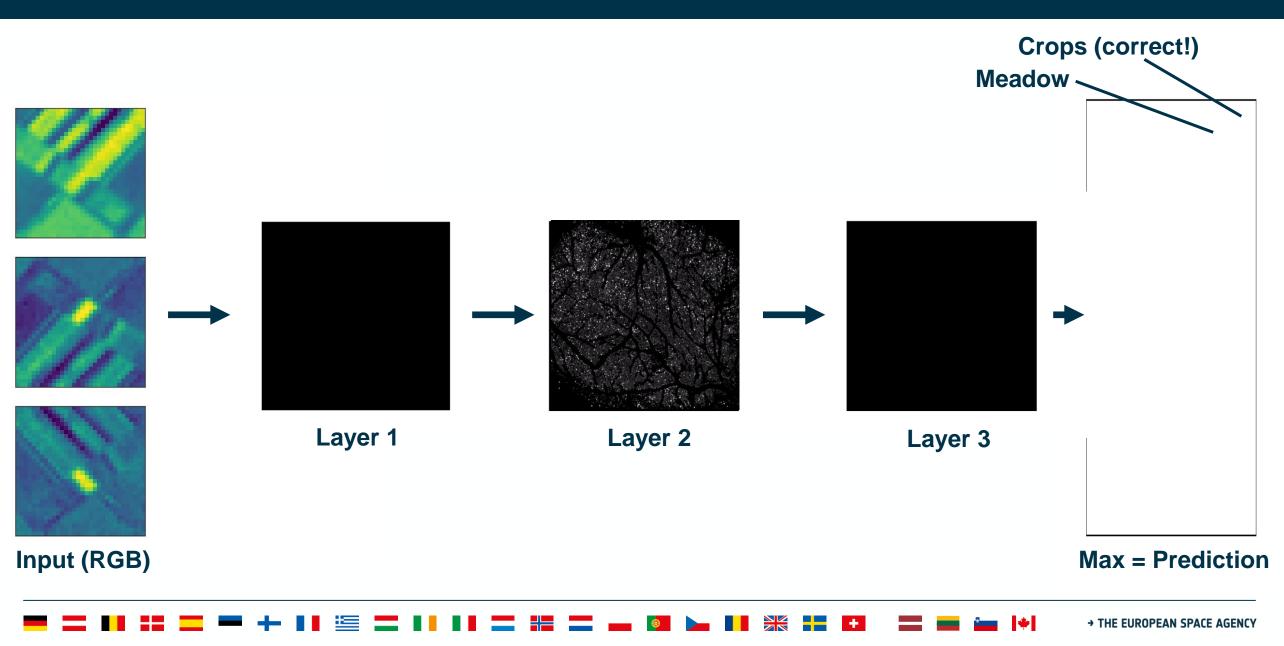




Power-efficient Sparse

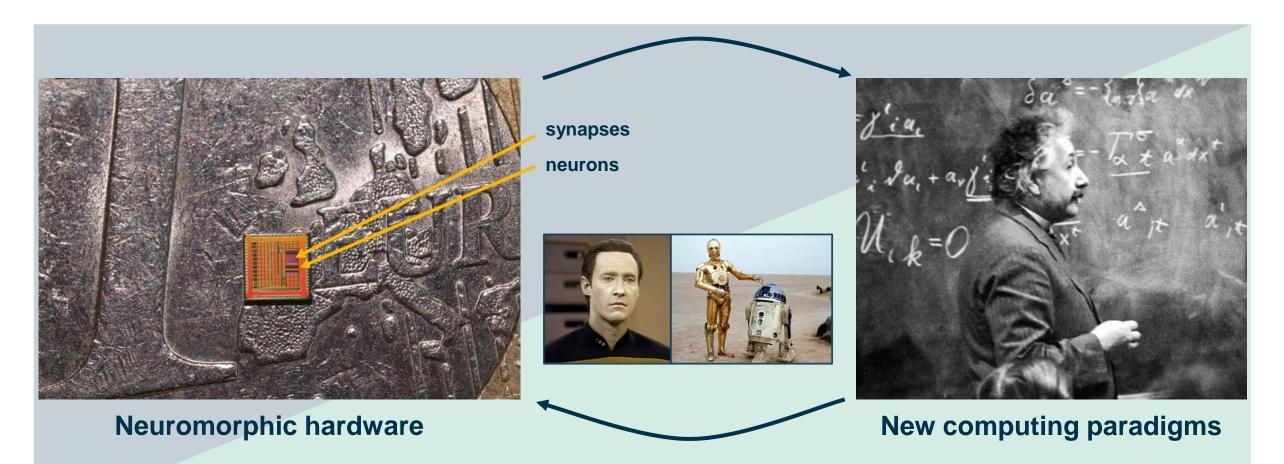
## **Brain-like computing for Earth Observation**





## **Neuromorphics: the substrate of AI in 20 years?**





# Thank you!