

# The 1986 Breakthrough: Rumelhart, Hinton & Williams

## David Rumelhart

UC San Diego

Cognitive Science  
PDP Framework



## Geoffrey Hinton

CMU/Toronto

Boltzmann Machines  
"Godfather of DL"



## Ronald Williams

Northeastern

REINFORCE Algorithm  
RL Pioneer



## Nature (1986)

*"Learning representations by back-propagating errors"*

Vol. 323, pp. 533-536

### Key Contributions:

- Made backpropagation accessible
- Demonstrated hidden representations
- Showed MLPs learn meaningful features
- Provided practical training algorithms
- Launched the connectionist revolution

*This paper is one of the most cited in all of computer science (100,000+ citations)*