



# 中国科学院生物物理研究所

## 贝时璋讲座

### Machine Learning and Learning Machines

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### 张奇伟教授简介

张奇伟教授毕业于中国科学技术大学，1981年考取第一批CUSPEA赴美国Rutgers大学，从师于美国著名院士Joel Lebowitz。1991年建立冷泉港第一个生物信息实验室，2002年成为冷泉港实验室首位取得正教授职位的华人科学家，2009年作为我国首批“千人计划”教授加入清华大学，2010年任UT Dallas系统生物学系主任。在 *Cell*, *Nature Genetics*, *PNAS* 等国际权威期刊发表论文200余篇



#### ABSTRACT

Machine learning has become a core technology for Bioinformatics and many other fields that is required for automatically mining big data, extracting complex information and turning them into scientific knowledge in the form of predictive models. On the other hand, life systems may be regarded as adaptive and predictive systems, hence, are natural learning machines (e.g. cells are molecular learning machines, brains are cellular learning machines). Both engineered machines (computers) and evolved machines (cells) are doing network computations and optimizations, it is important for biologists to understand machine learning principles in order to master bioinformatics tools; it is also important for engineers to learn evolutionary principles in order to understand how hierarchy or networked machines can make better machines in nature. In the future, when silicon and molecular machines merge into one, the distinction between computer and brain will also disappear. The essence of future BIG DATA may be such that all brains will be rendered as slaved sub-networks.