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Characterizing production and consumption in Physics QIAN ZHANG, FABIO CIULLA, BRUNO GONCALVES, NICOLA PERRA, ALESSANDRO VESPIGNANI, Northeastern University — We analyze the entire database of publications in the American Physical Society and generate longitudinal (50 years) citation networks at two different geographical levels. We define the knowledge diffusion proxy and Scientific Production Ranking algorithms to capture the complex nature of citation networks, and to provide a global view of spatial distributions of production and consumption of knowledge in Physics as well as its temporal evolution. Using the knowledge diffusion proxy we identify the key actors in producing and consuming knowledge in Physics as a function of time. The ranking results from the Scientific Production Ranking algorithm allow us to characterize the top countries/cities in the world for Physical sciences. Among all the results, we find that in 50 years major states and cities in US stably rank on the top and have been main knowledge producers, whereas the major European countries, Japan and Russia have greatly improved their their ranking since 1990. Interestingly, we notice that China and Spain as well as major cities in those countries have gradually become major knowledge consumers in the last two decades.

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