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Uncovering the Mediterranean Salt Giant (MEDSALT) – Scientific Networking as Incubator of Cross- disciplinary Research in Earth Sciences

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About 6 million years ago, the Mediterranean basin was the focus of one of the most extraordinary events in the recent geological history of the Earth: the so-called Messinian Salinity Crisis (MSC). MEDSALT aims to create a new flexible scientific network addressing the causes, timing, emplacement mechanisms, and consequences – at local and planetary scale – of the largest and most recent ‘salt giant’ on Earth: the Mediterranean Salt Giant (MSG). The MSG is a 1.5 km thick salt layer that was deposited on the bottom of deep Mediterranean basins about 5.5 million years ago, in late Miocene (Messinian), and is preserved beneath the deep ocean floor today. The origin of the Mediterranean salt giant is linked the Messinian Salinity Crisis. Research on the MSC has initiated one of the longest-living scientific controversies in Earth Science. Pioneering scientific drilling in 1970 induced some researchers to publish the theory of the ‘desiccation’ of the Mediterranean during the Messinian. In their view the Mediterranean Sea level dropped by 1–2 km and the basin was transformed into a huge hot, dry salt lake as a consequence of the tectonically-driven closure of the Atlantic gateway at the present-day Gibraltar strait.

This interpretation was successful not only among the scientific community, but also in public opinion. On one hand, the progress of scientific research provided additional evidence for the desiccation theory. On the other hand, researchers questioned the theory, providing alternative interpretations of the geological data, and theoretical arguments supporting a model of salt deposition from a deep brine, assuming a very limited sea level change. Controversial views also exist on the mechanisms that ended the MSC: was it a catastrophic flood of Atlantic waters from the re-opening of the Atlantic gateway, or a slow mixing with brackish water from the Black Sea area first before the re-establishment of the normal marine connection with the Atlantic Ocean? In order to trigger progress on the understanding of the MSC, a widespread international scientific community has promoted the largest coordinated research on the MSC since its discovery, clustered around scientific drilling. COST (European Cooperation in Science and Technology) was identified as the most appropriate tool, as COST Actions provide tools for networking, training, mobility and dissemination. The network has further promoted one Marie Skłodowska-Curie European Training Network (SALTGIANT) offering 15 PhD fellowships across Europe. New contacts have been activated with a variety of stakeholders, including governmental administrations, non-governmental organizations, the industry and, indirectly, society at large, demonstrating the

importance that science and society renew a relationship of trust and confidence. In all, 200 scientists are working together – across disciplines such as geophysics, geology, biology, microbiology, and also social sciences – towards a common scientific goal: uncovering the Mediterranean salt giant.