

## פרופ. מרדכי שטיין

פרופסור מן המניין (adjunct) המכון למדעי כדה"א האוניברסיטה העברית ירושלים

המכון הגיאולוגי

Adjunct Senior Research Scientist at Columbia University, NY

### תחומי מחקר:

- גיאולוגיה של הרביעון: אקלים ורעידות אדמה עתיקות
- גיאוכימיה של איזוטופים רדיואקטיביים
- התפתחות גופי המים בבקע ים המלח
- שינויים במפלסי הים וטקטוניקה חופית מתוך ריפים של אלמוגים
- התפתחות הליתוספירה היבשתית והקרום היבשתי בשילד הערבי נובי
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### פרויקטים ומענקי מחקר עיקריים (עשר שנים אחרונות):

- פרויקט הקדוח העמוק של ים המלח
- מקורות ודרכי הובלה של אבק מדברי לים האדום ובקע ים המלח
- מפלסי ים וטקטוניקה חופית במפרץ עקבה מתוך ריפים של אלמוגים
- פטרוגניזה של מגמות בזלתיות

### פרסומים (2017-2021):

Kitagawa H., **Stein M.**, Goldstein SL, Nakamura T., Lazar B. (2017). A preliminary radiocarbon chronology of the uppermost 150m sediment from the ICDP core 5017-1 site, the deepest point of the northern Dead Sea. *Radiocarbon*, 59, 383–394.

Yehudai M., Lazar B., Bar N., Agnon, A., Shaked Y., **Stein M.** (2017) U-Th dating of calcitic corals from the Gulf of Aqaba. *Geochimica et Cosmochimica Acta* 198, 285–298.

Miebach A., Chen C., Schwab M., **Stein M.**, Litt T. (2017) Vegetation and climate during the Last Glacial high stand (ca. 28–22 ka BP) of the Sea of Galilee, northern Israel. *Quat. Sci. Rev.*

Kiro Y., Goldstein SL, Garcia-Veigas J., Levy E., Kushnir Y., **Stein M.**, Lazar B. (2017). Relationships between lake-level and water and salt budgets in the Dead Sea during extreme aridities in the Eastern Mediterranean. *Earth Planet. Sci. Lett.*, 464, 211–226.

Levy EJ, **Stein M.**, Lazar B., Gavrieli I., Yechieli Y., Sivan O., (2017) Pore fluids in Dead Sea sediment core reveal linear response of lake chemistry to global climate changes. *Geology*

Palchan D., Neugebauer I., Amitai Y., Waldmann N., Schwab MJ, Dulski P, Brauer A., **Stein M.**, Erel Y., Enzel Y. (2017) North Atlantic controlled depositional cycles in MIS 5e layered sediments from the

deep Dead Sea basin. *Quaternary Research*, 87, 168–179.

Shalev N., Gavrieli, Halicz H., Sandler A., **Stein M.**, Lazar B. (2017) Enrichment of  $^{88}\text{Sr}$  in continental waters due to calcium carbonate precipitation. *Earth Planet. Sci. Lett.*, 458, 381-393.

Torfstein A., Teutsch N., Tirosh O., Shaked Y, Rivlin T., Zipori A., **Stein M.**, Lazar B. (2017) Chemical characterization of atmospheric dust from a weekly time series in the north Red Sea between 2006-2010. *Geochimica et Cosmochimica Acta* 211, 373-393.

Fruchter N.\*\*, Lazar B., Nishri A., Almogi-Labin A., Eisenhauer A., Be'eri Shlevin, **Stein M.** (2017)  $^{88}\text{Sr}/^{86}\text{Sr}$  fractionation and calcite accumulation rate in the Sea of Galilee. *Geochimica et Cosmochimica Acta* 215, 17-32.

Rozenbaum A., Shaked-Geband D., **Stein M.**, Mienis HK, Rabinovich R. (2017) The first evidence for ancient deer (Cervidae family) in the late Miocene Bira Formation in Northern Israel. PlosOne. <https://doi.org/10.1371/journal.pone.0185268>

Palchan D., **Stein M.**, Goldstein SL, Almogi-Labin A., Tirosh O., Erel Y. (2018) Synoptic conditions of fine-particle transport to the last interglacial Red Sea –Dead Sea from Nd-Sr compositions of sediment cores. *Quaternary Science Reviews* 179, 123-136.

Kagan E., **Stein M.**, Marco S. (2018) Integrated paleoseismic chronology of the last glacial Lake Lisan: from lake-margin seismites to deep-lake mass-transport deposits. *Journal of Geophysical Research: Solid Earth*, 123, 2806–2824. <https://doi.org/10.1002/2017JB014117>.

Ebert Y., Shaar R., Emmanuel S., Nowaczyk N., **Stein M.** (2018) Overwriting of sedimentary magnetism by bacterially mediated mineral alteration. *Geology*

Levy EJ, Yechieli Y., Gavrieli I., Lazar L., Kiro Y., **Stein M.**, Sivan O. (2018) Salt precipitation and dissolution in the late Quaternary Dead Sea from chemical and  $\delta^{37}\text{Cl}$  composition of pore fluids and halites. *Earth Planet. Sci. Lett.* 487, 127-137.

Torfstein A., Stein M., Goldstein SL (2018) Enhanced Saharan dust input into the Levant during Heinrich stadials. *Quaternary Science Reviews* 186, 1-14.

Weber N., Yechieli Y, **Stein M.**, Yokochi R., Gavrieli I., Zappala J., Mueller P., Lazar B. (2018) The circulation of the Dead Sea brine in the regional aquifer. *Earth Planetary Science Letters* 493, 242-261.

Bar N., Agnon A., Yehudai M., Lazar L., Shaked Y., **Stein M.** (2018) Last interglacial sea levels and regional tectonics from fossil coral reefs at the Gulf of Aqaba. *Quaternary Science Reviews*, 191, 41-56.

Zaarur S., **Stein M.**, Adam O., Mingram J., Chu G., Liu J., Wu J., Erel Y. (2018) Late Quaternary climate in southern China deduced from Sr-Nd isotopes of Huguangyan Maar sediments. *Earth Planetary Science Letters* 496, 10–19.

Palchan D., Erel Y., **Stein M.** (2018b) Geochemical characterization of contemporary fine detritus in the Dead Sea watershed. *Chemical Geology*. 494, 30-42.

Coianiz L., Ben-Avraham Z., **Stein M.**, Lazar M. (2019) Spatial and temporal

reconstruction of the late Quaternary Dead Sea sedimentary facies from geophysical properties. *Jr. of App. Geoph.* 160, 15–27.

Rozenbaum A., Sandler A., **Stein M.**, Zilberman E., (2019) The sedimentary and environmental history of Tortonian-Messinian lakes at the East Mediterranean margins (northern Israel). *Sedimentary Geology*, 383, 268–292.

Kushnir Y. and **Stein M.** (2019) Medieval Climate in the Eastern Mediterranean: Instability and Evidence of Solar Forcing. *Atmosphere*, **10**, doi:10.3390/atmos10010029

Lev L., **Stein M.**, Ito E., Fruchter N., Ben Avraham Z., Almogi-Labin A. (2019) Sedimentary, geochemical and hydrological history of Lake Kinneret during the past 28,000 years. *Quaternary Science Reviews* 209, 114-128.

Shaked-Gelband, D., Edelman-Furstenberg Y., **Stein M.**, Starinsky A. (2019) Dolomite formation during enhanced evaporation of ancient carbonate freshwater lake (late Miocene, Israel). *Sedimentology*.

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Palchan D., Erel Y., **Stein M.** (2019) Mobilization of fine detritus to the Dead Sea Basin during the late glacial and early Holocene. *Quaternary Science Reviews*, 218, 395-405.

Belmaker R., Lazar B., **Stein M.**, Taha N., Bookman R. (2019) Constraints on aragonite precipitation in the Dead Sea from geochemical measurements of flood plumes. *Quaternary Science Reviews* **221**. <https://doi.org/10.1016/j.quascirev.2019.105876>

Levy E., Sivan O., Antler G., Lazar B., **Stein M.**, Yechieli Y., Gavrieli I. (2019) Mount Sedom salt diapir - Source for sulfate replenishment and gypsum supersaturation in the last glacial Dead Sea (Lake Lisan). *Quaternary Science Reviews* **221**.

Levy E., Sivan O., Antler G., Lazar B., **Stein M.**, Yechieli Y., Gavrieli I. (2020) Reply to Charrach (2019) Reply on comment “Mount Sedom salt diapir -Source for sulfate replenishment and gypsum supersaturation in the last glacial Dead Sea (Lake Lisan)” by Levy et al. (2019). *Quaternary Science Reviews* **221**.

Bergel S., Barkan E., **Stein M.**, Affek HP (2020) Carbonate  $^{17}\text{O}_{\text{excess}}$  as a paleohydrology proxy: Triple oxygen isotope fractionation between  $\text{H}_2\text{O}$  and biogenic aragonite of freshwater mollusks. *Geochimica et Cosmochimica Acta*, 275, 36-47.

Zaarur S., **Stein M.**, Adam O., Mingram J., Liu J., Wu J., Erel Y. (2020) Synoptic stability and anomalies in NE China inferred from dust provenance of Sihailongwan Maar sediments during the past ~80 kyr. *Quaternary Science Reviews* 239

Weber N., Lazar B., Stern O., Burr G., Gavrieli I., Roberts M., Kurz MD, Yechieli Y., **Stein M.** (2020) Radiocarbon reservoir ages in the Holocene Dead Sea. *Radiocarbon*, 62, 1453-1473.

Goldstein SL, Kiro Y., Torfstein A., Kitagawa H., Tierney J., **Stein M.** (2020) Revised chronology of the ICDP Dead Sea deep drill core relates drier-wetter-drier climate cycles to insolation over the past 220 kyr. *Quaternary Science Reviews*.

Kiro Y., Goldstein SL, Kushnir Y., Lazar B., **Stein M.** (2020) Droughts, flooding events, and shifts in water sources and seasonality characterize last interglacial Levant climate” on the hydroclimate history of the Dead Sea basin during MIS 5e. *Quaternary Science Reviews* 248.

Ebert, Y., Shaar, R., Levy, E. J., Zhao, X., Roberts, A. P., **Stein M.** (2020) Magnetic properties of late Holocene Dead Sea Sediments as a monitor of regional hydroclimate. *Geochemistry, Geophysics, Geosystems*, 21, e2020GC009176. <https://doi.org/10.1029/2020GC009176>.

**Stein M.** and Goldstein SL (2020) The ICDP dead sea deep drilling project – introduction. *Quaternary Science Reviews*. 249.

Weber, N., Lazar, B., Gavrieli, I., Yechieli, Y., & **Stein, M.** (2021). Gypsum deltas at the Holocene Dead Sea linked to grand solar minima. *Geophysical Research Letters*, 48, e2020GL091034. <https://doi.org/10.1029/2020GL091034>

Ebert Y., Shaar R., **Stein M.** (2021) nDecadal geomagnetic secular variations from greigite bearing Dead Sea sediments. *Geochemistry, Geophysics, Geosystems* (in press)

Rozenbaum A. **Stein M.**, Zilberman, Shaked Gelband D., Starinsky A., Sandler A. (2021) Sr isotopes in the Tortonian-Messinian Lake Bira and Gesher marshes, Northern Valleys of Israel: Implications for hydroclimate changes in East Mediterranean -Levant margins *Bull. Geol. Soc. Am.*

#### פרסים חשובים:

**1993:** Prof. R. Freund Award of The Geological Society of Israel.

**2019:** Fellow of the Geochemical Society and the European Association of Geochemistry

**2021:** The Honorary Fellowship of the Israeli Geological Society