How magnets and mathematics can help solve the current water crisis
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Although water was once considered an almost unlimited resource, population growth, drought and contamination are straining our water supplies. Up to 70% of deaths in Bangladesh are currently attributed to arsenic contamination, highlighting the essential need to develop new and effective ways of purifying water.

Since arsenic binds to iron oxide, magnets offer one such way of removing arsenic by simply pulling it from the water. For larger contaminants, filters with a spatially varying porosity can remove particles through selective sieving mechanisms.

Here we develop mathematical models that describe each of these scenarios, show how the resulting models give insight into the design requirements for new purification methods, and present methods for implementing these ideas with industry.

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