Nieuwe technologie mogelijk maken

Matchmaking event “maritime challenges 2015”
Nieuwegein, January 15, 2015

Water technology meets chaos theory

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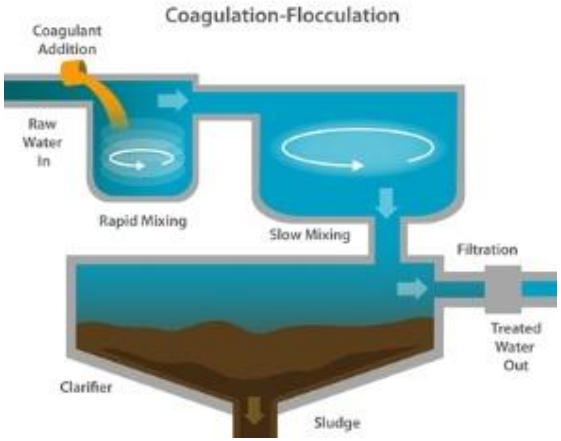
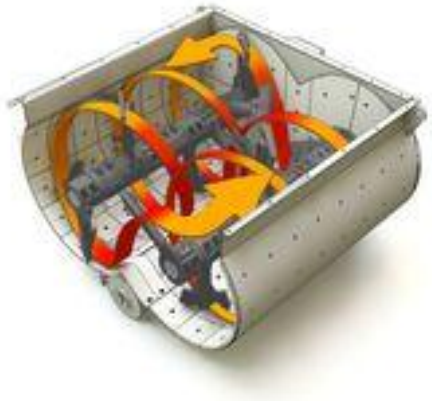
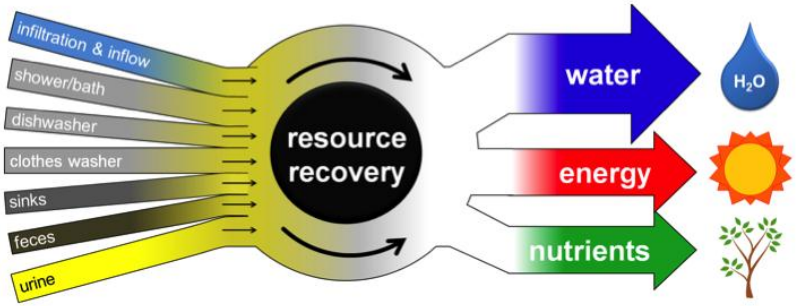
Where innovation starts

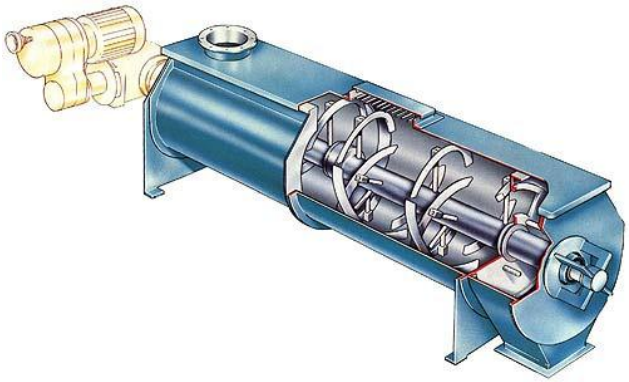
Water treatment ⇔ industrial mixing & heat transfer

Common denominator: transport and mixing of additives, chemicals, heat *etc* in flows:









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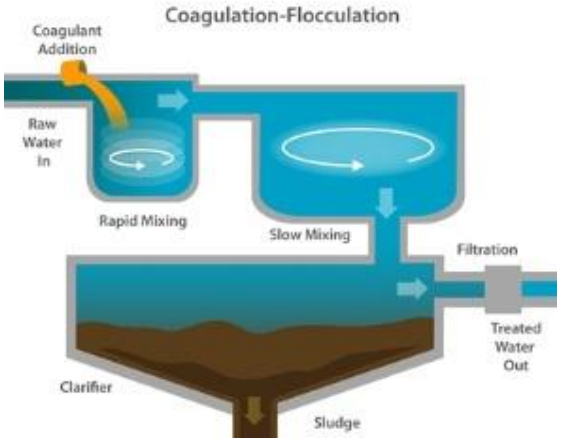
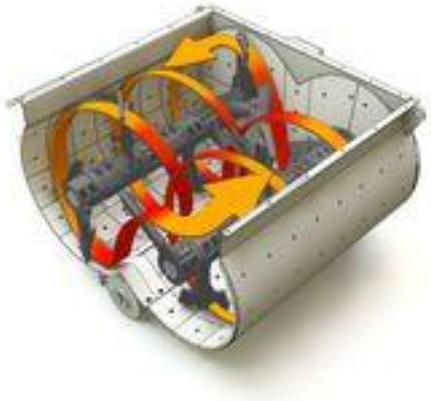
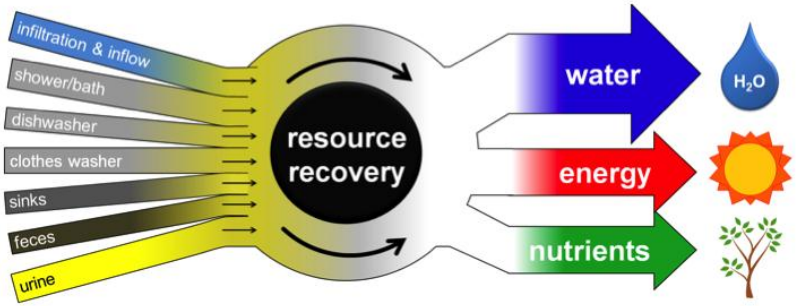
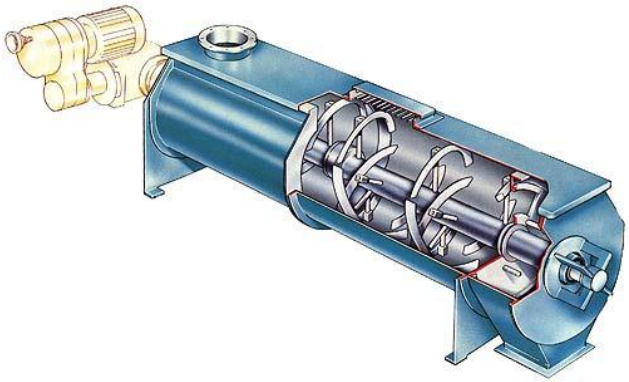






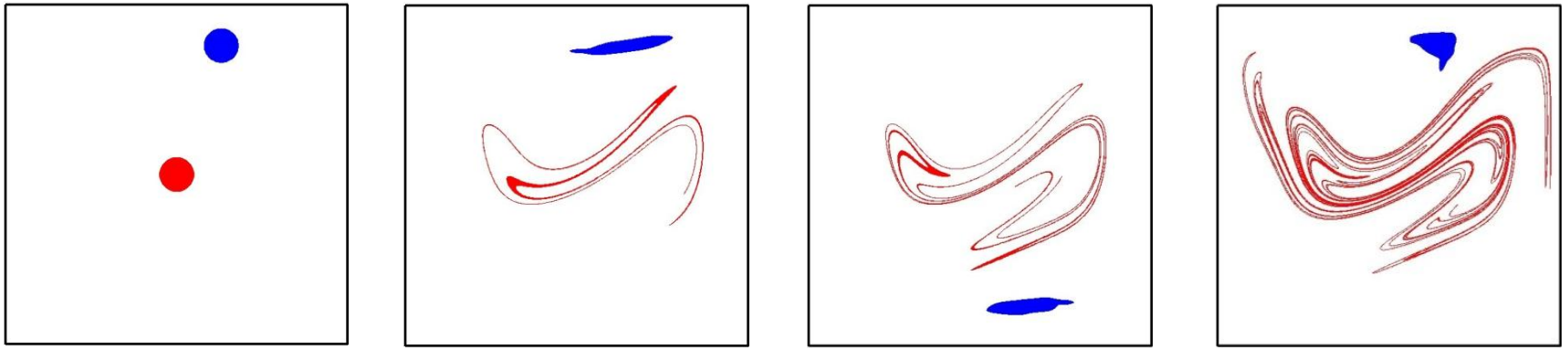


Bridges gap to application of CHAOS for process development & optimization!

Chaos as enabler of efficient transport and mixing

Mixing & heat-transfer technology benefitted greatly from CHAOTIC ADVECTION:

- **non-chaotic versus chaotic advection:**



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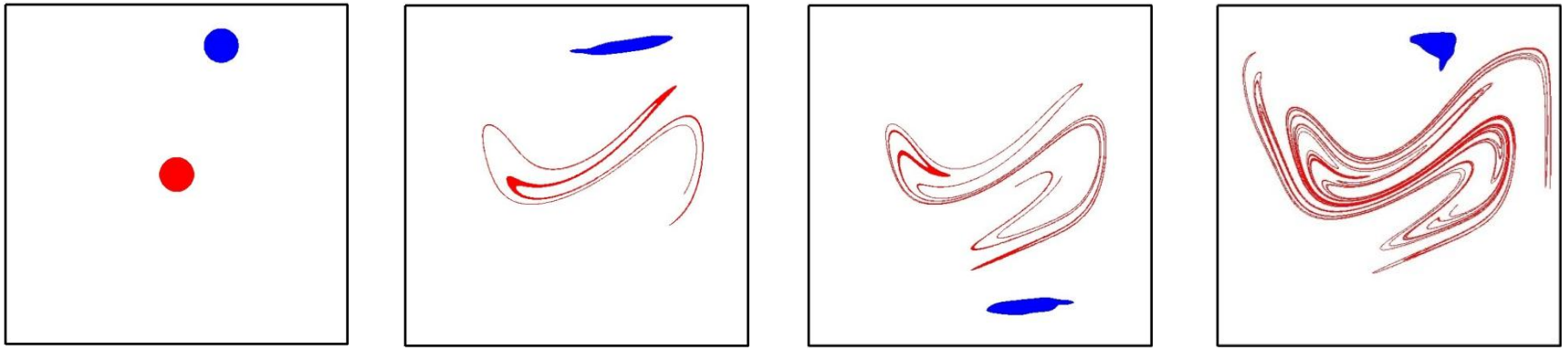

- **chaos:** enhances dispersion, increases heat-transfer rates, accelerates chemical reactions, ...
- behavior can be **systematically predicted & achieved** by **chaos theory**

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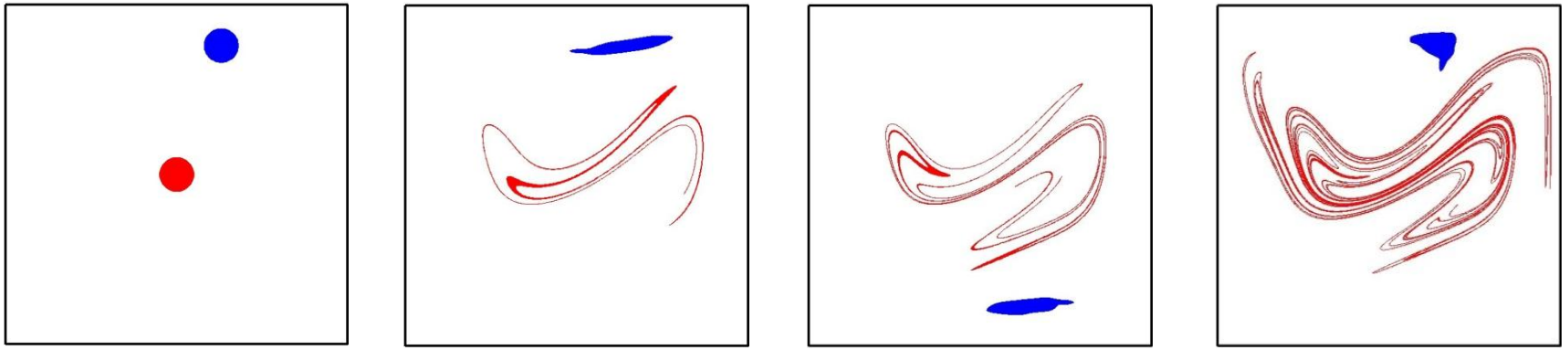

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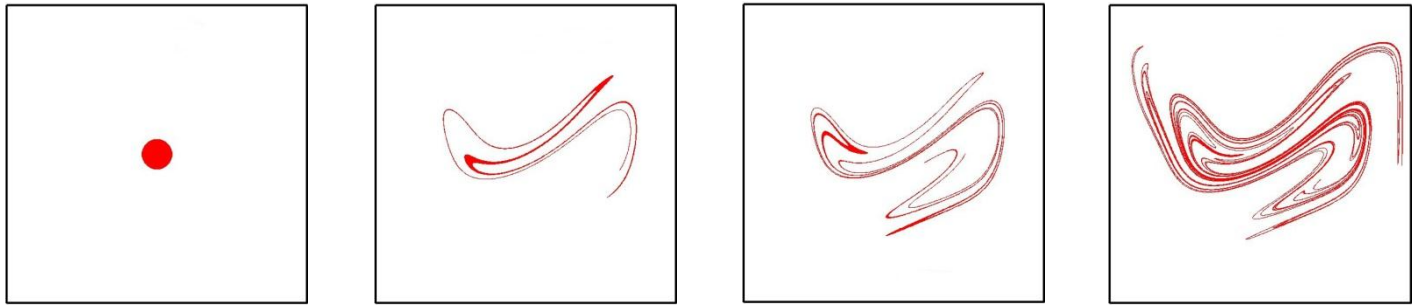
RESEARCH TOPIC: utilize & exploit chaos in similar ways for WATER TREATMENT

Potential applications of chaos in water treatment

Process enhancement: **e.g. efficient dispersion of chemicals by chaotic advection:**



- **also: enhanced heat recovery from basins, acceleration of chemical reactions, ...**

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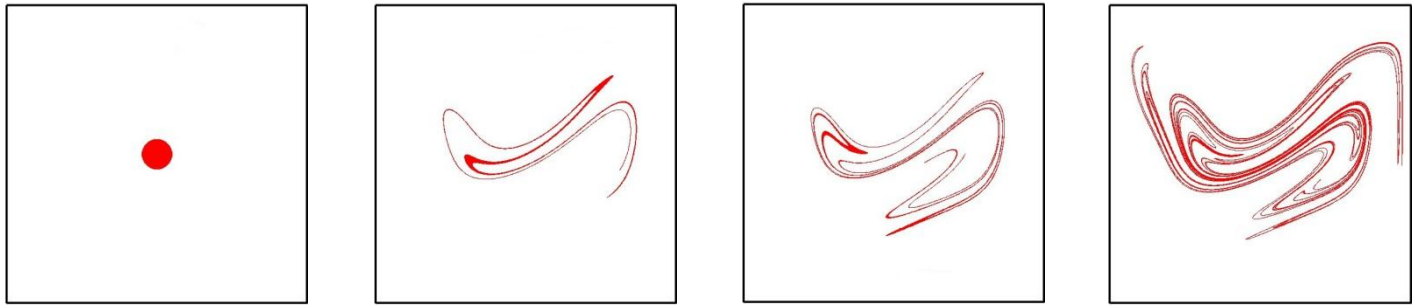

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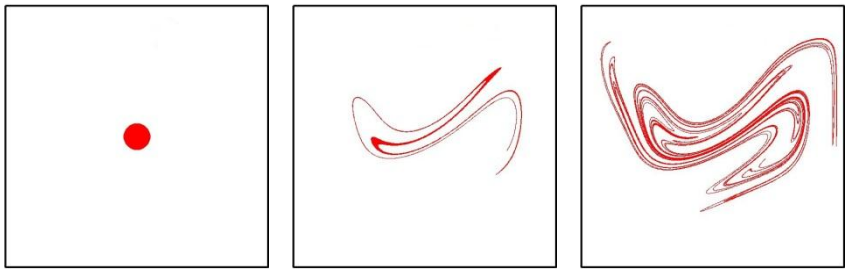
New concepts: **e.g. contaminant removal by mixing & “unmixing”:**



disperse binding agent (<u>forward</u> flow)

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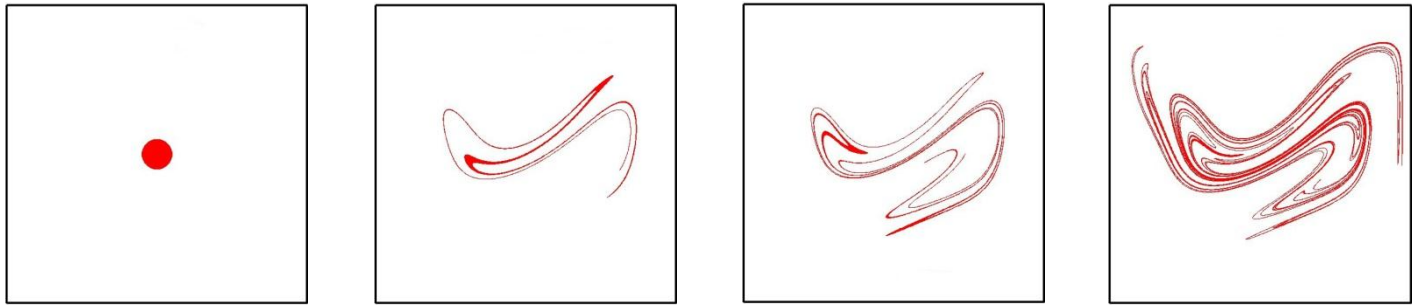

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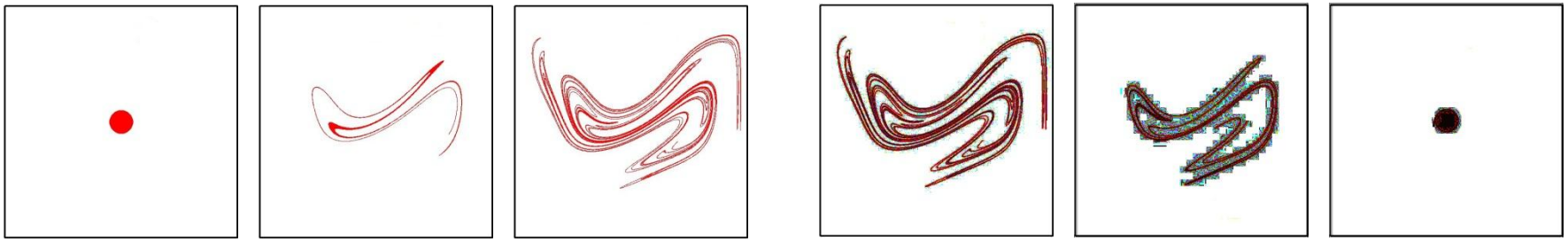

disperse binding agent (<u>forward</u> flow)

concentrate bound contaminant (<u>reversed</u> flow)