Physically-Based Simulation for Computer Graphics

Project Results: Meteorite strike

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Inspiration

https://www.google.com/search?biw=1280&bih=561&tbm=isch&sa=1&ei=RRAZXLLyCoywrgSIhbuYCQ&q=meteorite+in+ocean&oq=meteorite+in+ocean&gs_l=img.3...21824.22466..22628...0.0..0.97.448.5......0....1..gws-wiz-img.GVEnOnzLP1M#imgrc=YrRoqH8ERfMx6M:

Last time…

Problems with 2D simulation:
- Symmetry
- Stability
- Incompressibility

Don't you remember?

Last time...

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Debugging

https://d20eq91zdmkqd.cloudfront.net/assets/images/book/large/9781/4053/9781405306508.jpg
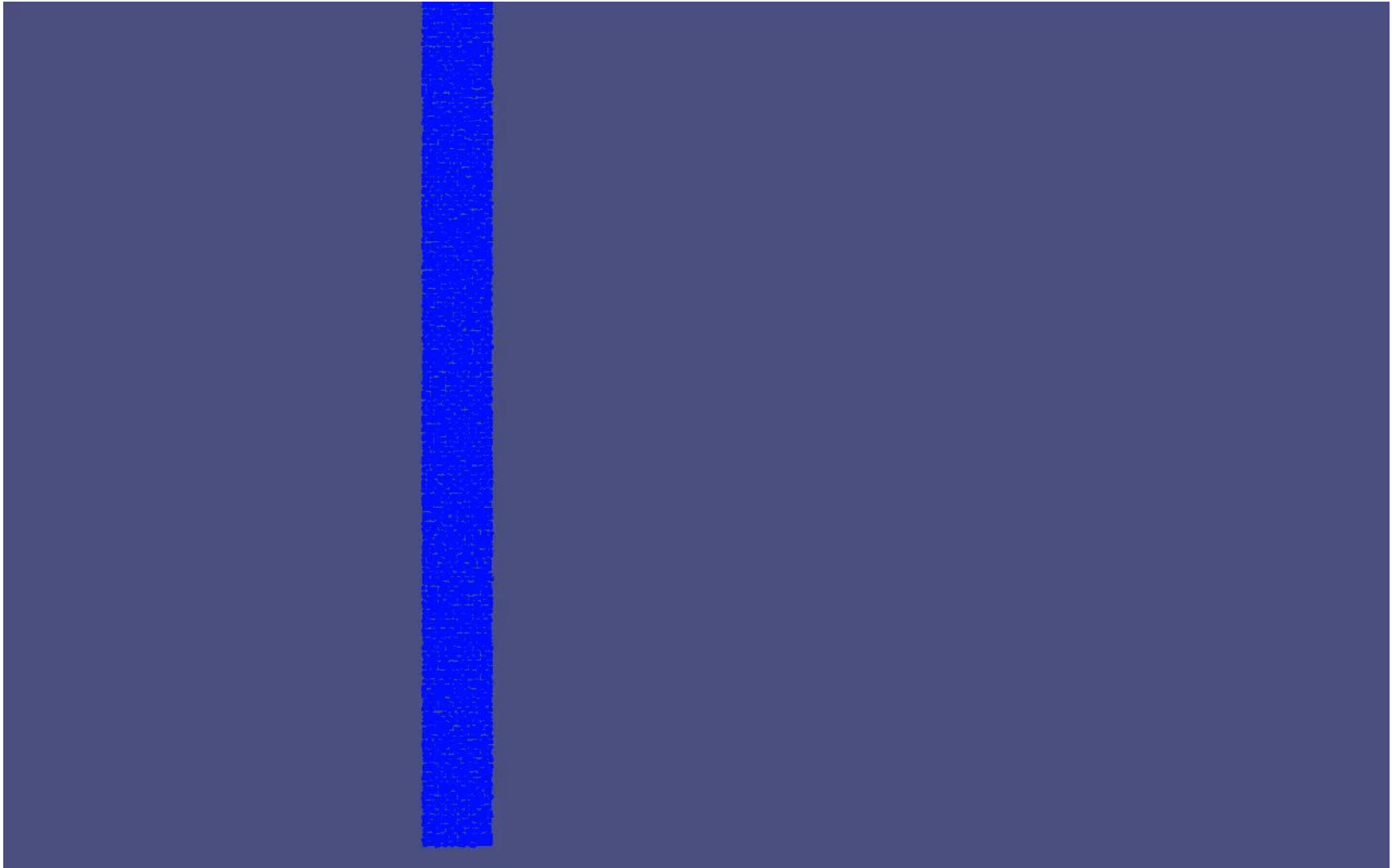
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2D Problems

The problems were:

- Symmetry → wrong indices
- Stability → more PIC on boundary
- Incompressibility → error in pressure matrix

The main problem were **indices** and **typos**!

2D final result

3D

From the 2D to the 3D we had to do:

- Expand our grid in the z-dimension

- Adapt the algorithm to the z-dimension

In order to get a rendered image we had to do:
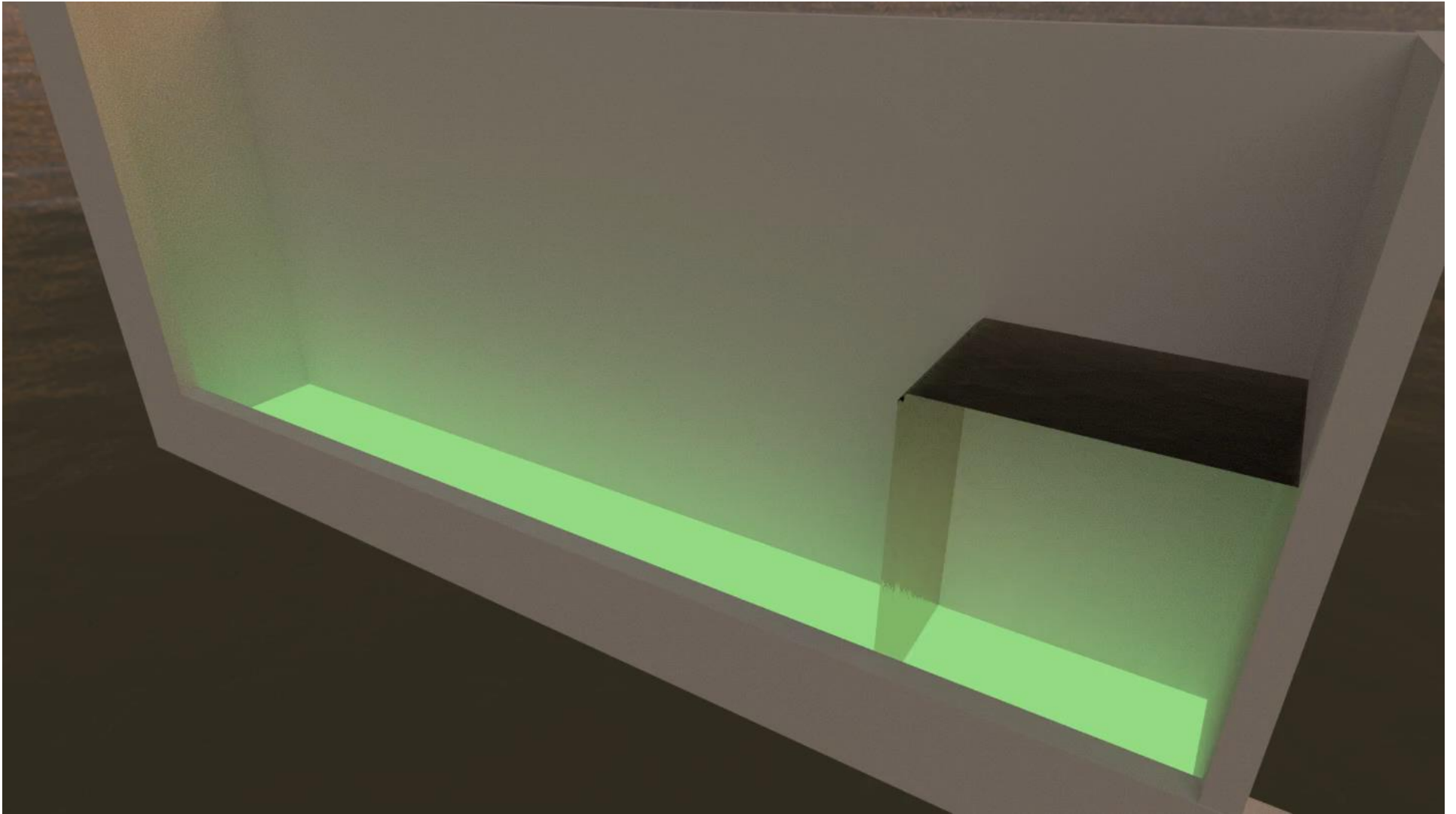
- Level set function

More bugs

https://www.wired.com/wp-content/uploads/blogs/magazine/wp-content/images/19-11/ff_betterlivingb_f.jpg
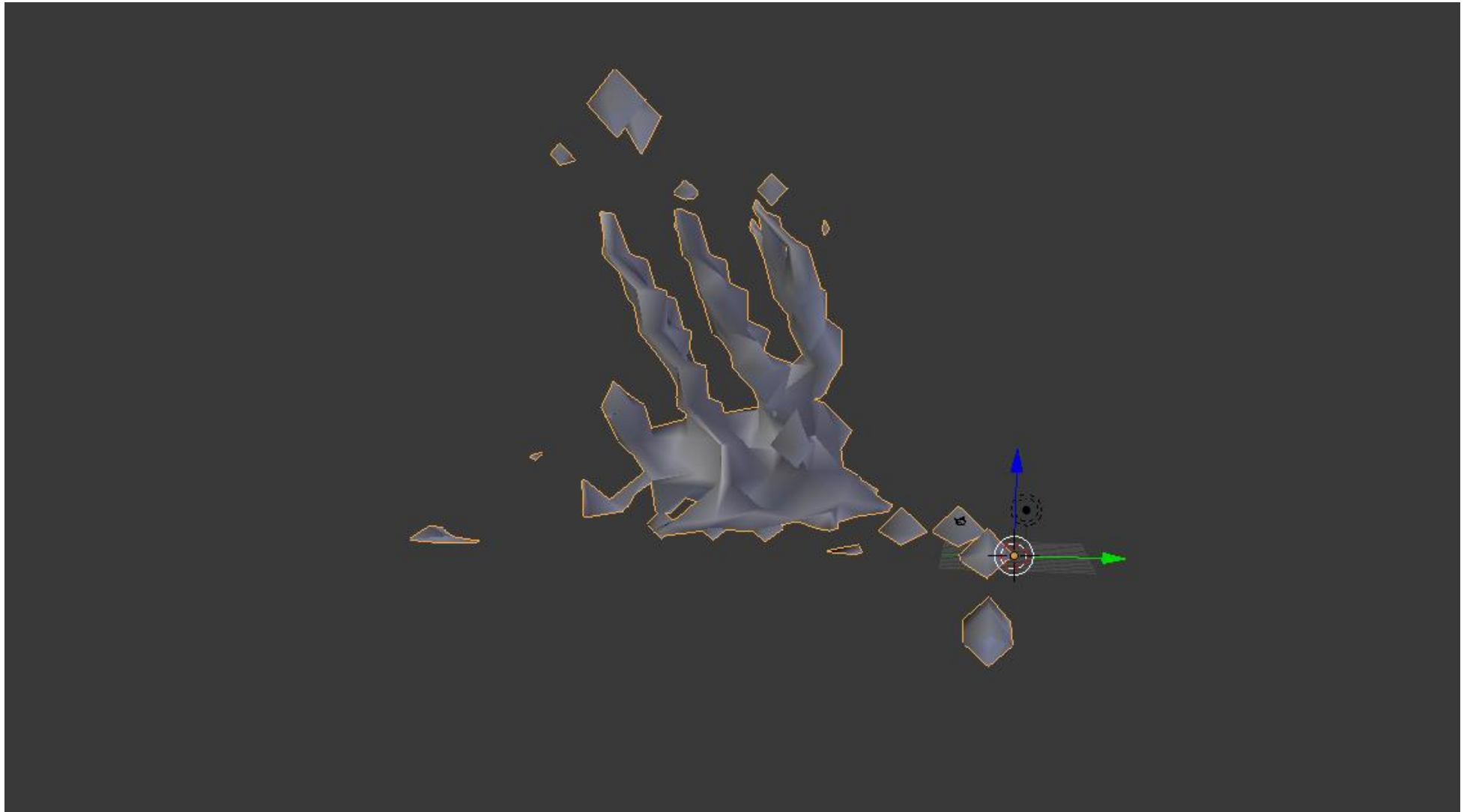
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3D Problems

The problems were:

- Symmetry → wrong indices

- Level set function → wrong

  implementation!
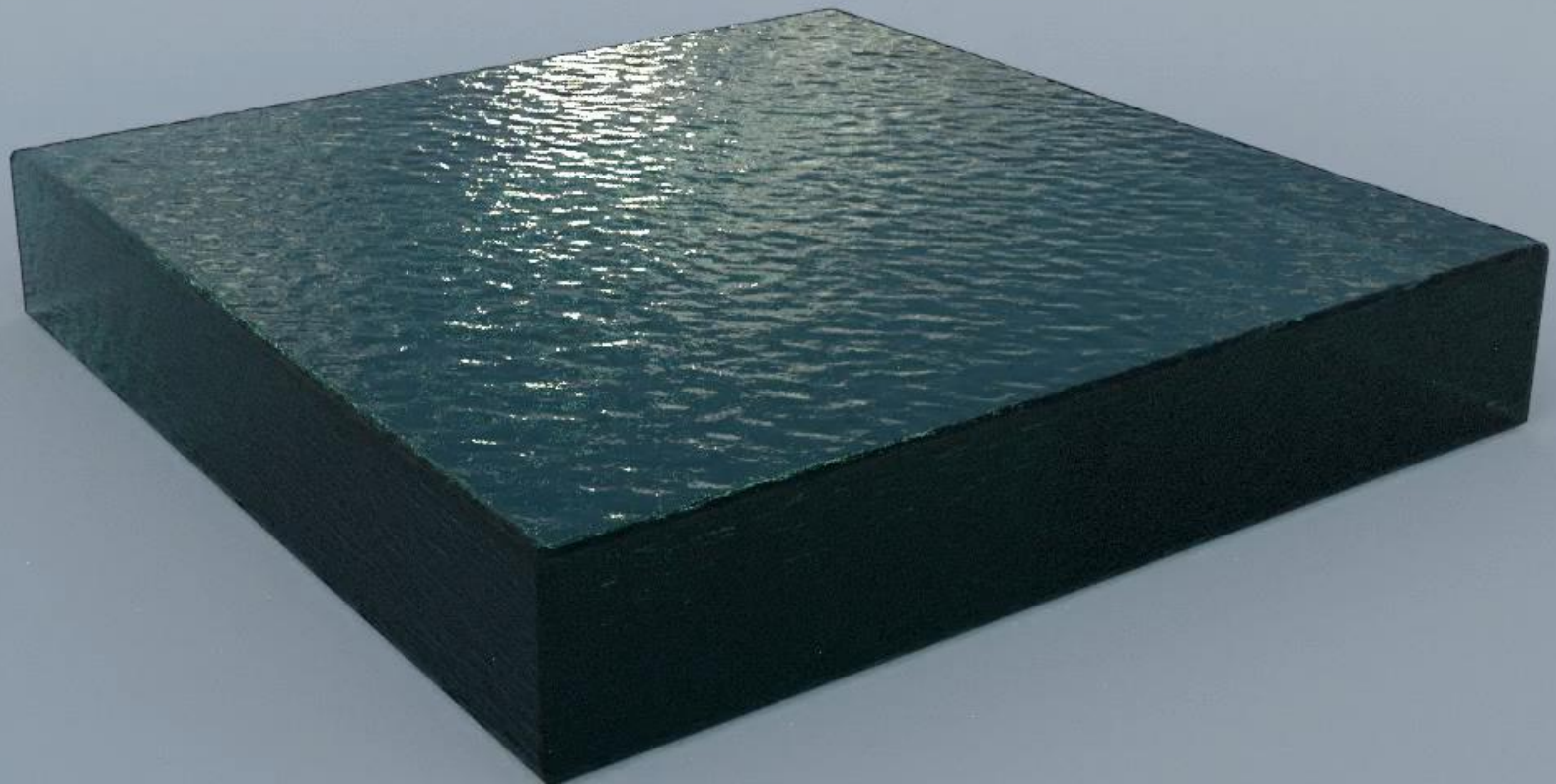
3D Problems

3D Problems

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Final Work

https://r-loops.com/web/uploads/images/entries/600/Music-Rendering-Do-you-know-this-feelin--6675063.jpg

Final video

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Improvements

- Better level set function

- Improve the runtime of our simulation

- Implement smoke and lather

- Implement fluid-solid interactions

Thank you for the attention, any questions?