Merry Christmas
and Happy New Year 2026

Find T such that

$$\int_{\text{\textpine}} h\kappa \, \nabla v \cdot \nabla T \, d\mathbf{x} + \int_{\text{\textpine}} v\varepsilon \left(\sigma T^4 - E\right) d\mathbf{x} = 0$$

with candle flames as boundary conditions.

hot

cold

Merry Christmas and Happy New Year 2026

The Research Unit of Computer Graphics wishes you a Merry Christmas with this brilliantly illuminated Christmas tree. Its temperature field is simulated using GPU-accelerated photon tracing [1, 2]: millions of perfectly traced rays contributing to a radiative transport operator driving a non-linear Newton-Raphson solver. In this season of light, let us celebrate the beauty that emerges when physics meets festive geometry, Monte Carlo convergence brings tidings of joy, and your RTX card finally earns its keep doing something other than training yet another diffusion model. Wishing you low RMSE in your experiments, convergence in your solvers, and just enough noise to make the magic feel real.

Merry Christmas and a radiantly rendered New Year!

[1] C. Freude, D. Hahn, F. Rist, L. Lipp, and M. Wimmer, "Precomputed Radiative Heat Transport for Efficient Thermal Simulation"

Computer Graphics Forum, 42, 7, 2023, doi: 10.1111/cgf.14957.

[2] C. Freude, L. Lipp, M. Zezulka, F. Rist, M. Wimmer, and D. Hahn, "Inverse Simulation of Radiative Thermal Transport"

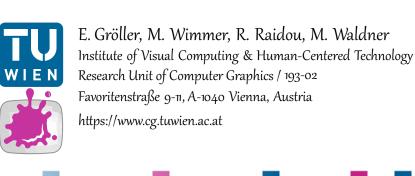Computer Graphics Forum, 44, 2, 2025, doi: 10.1111/cgf.70048.

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T ... temperature
h ... shell thickness
κ ... thermal conductivity
v ... FEM test function
ε ... emissivity
σ ... Stefan-Boltzmann constant
E ... irradiance

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