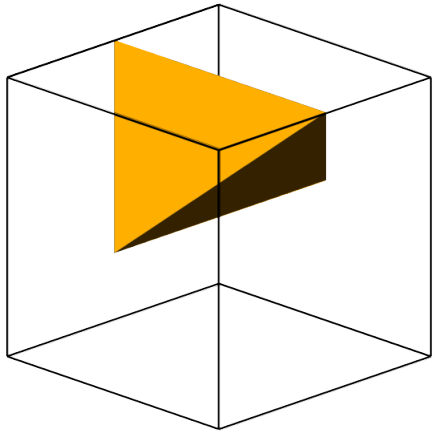
Lautsch Finite Elemente GmbH



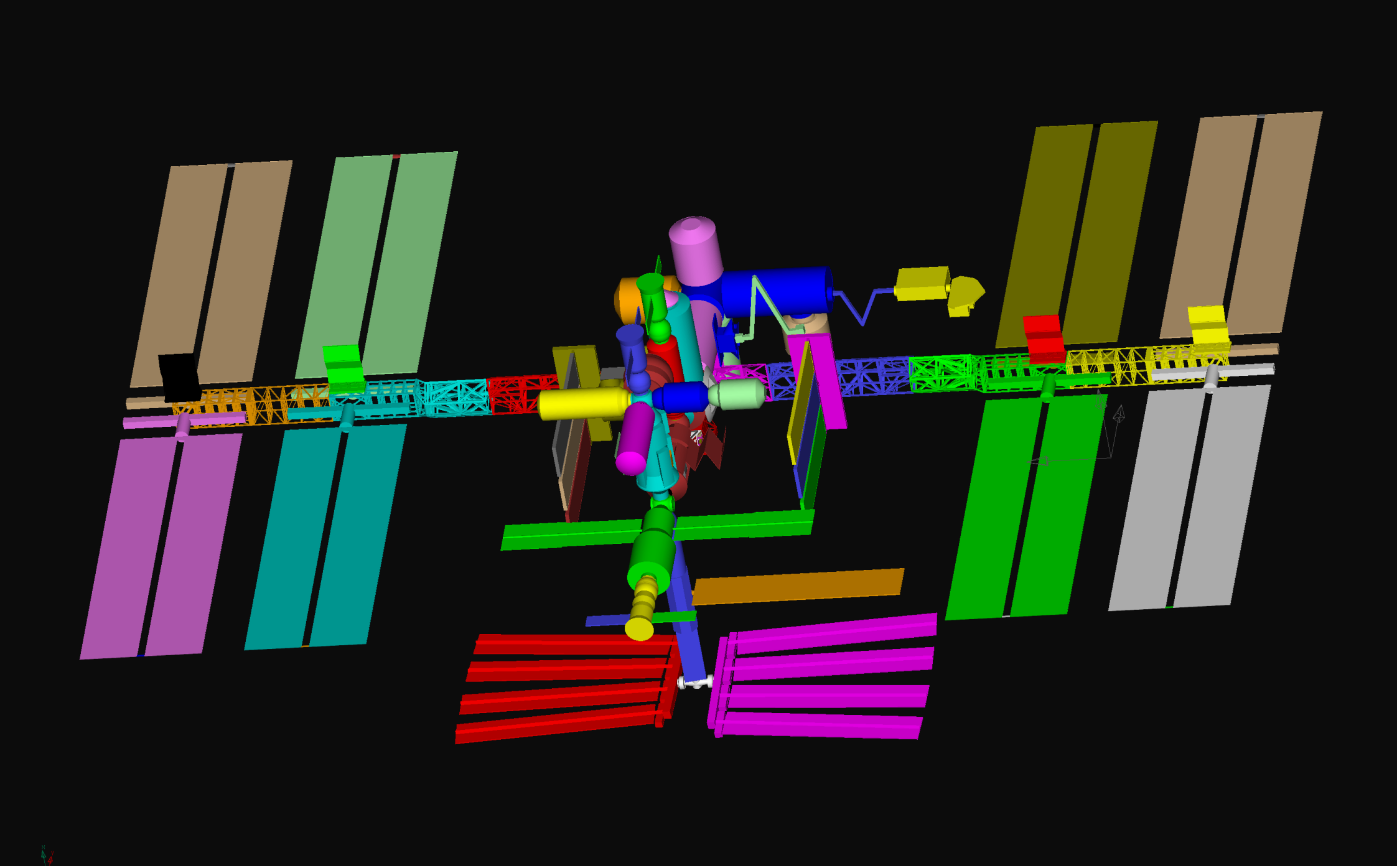
ISS International Space Station
MMT Multigrid Marching Tetra

Data GRABCAD
https://grabcad.com/library/the-international-space-station-iss-1

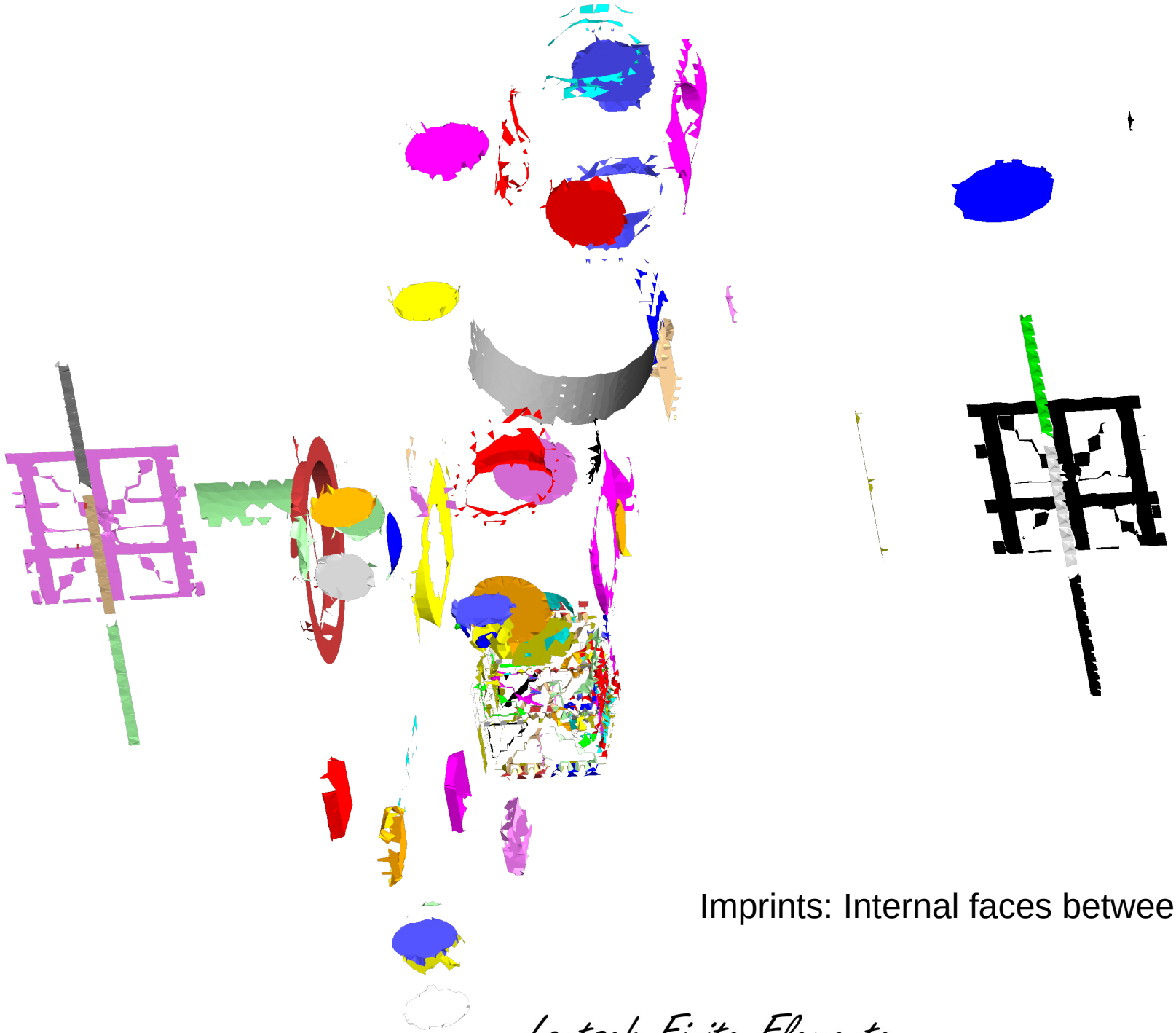
Created by Nishant Bodkhe, Bengaluru, India, June 2023

IGES	to	STL	by anyconv.com
	to	NASTRAN	Medina
	to	multi part	Medina node equivalence, distance 0.0, LFE SPLIT UP

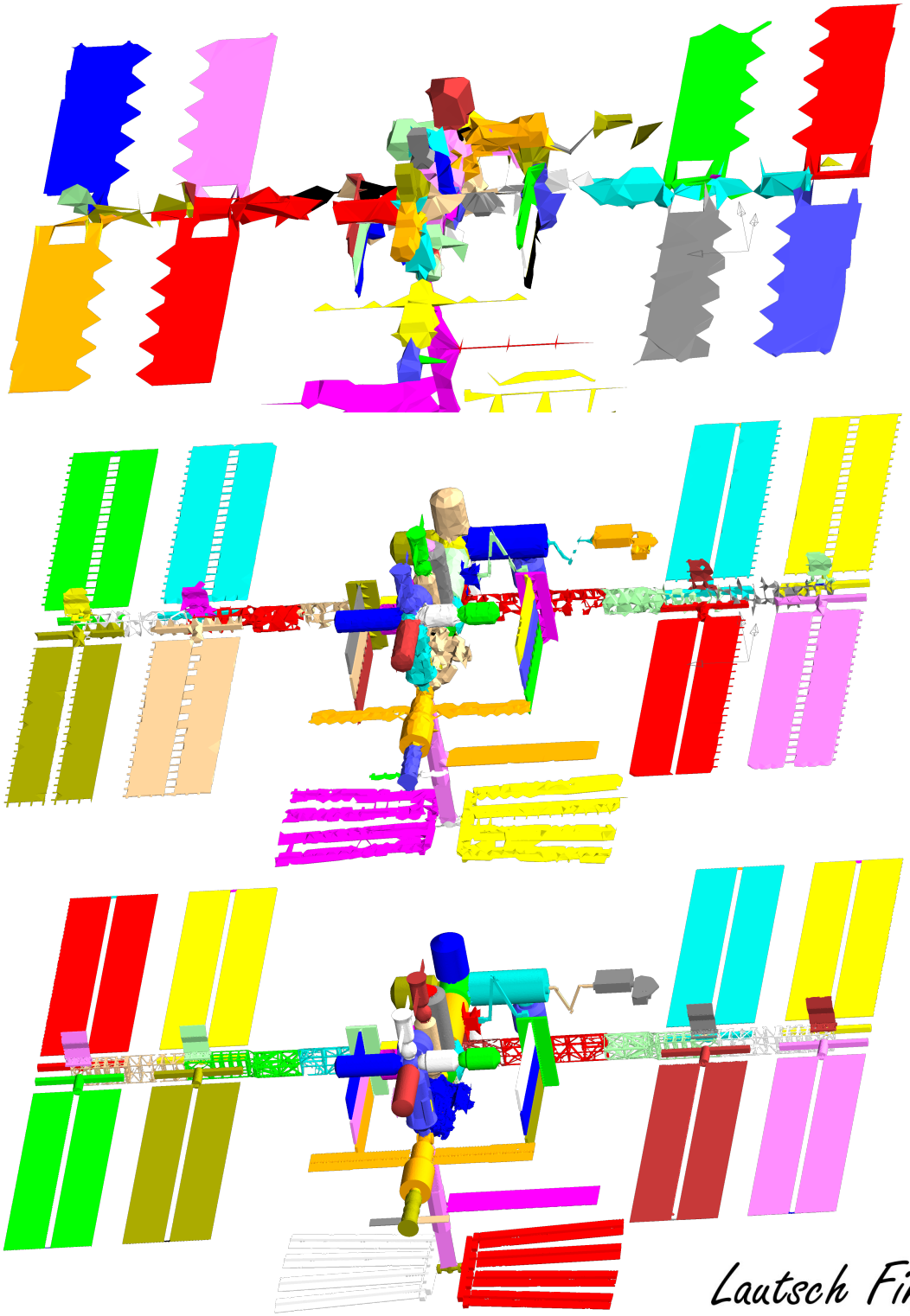
98 parts, 20 parts free edges or Tjoints



98 parts CAD



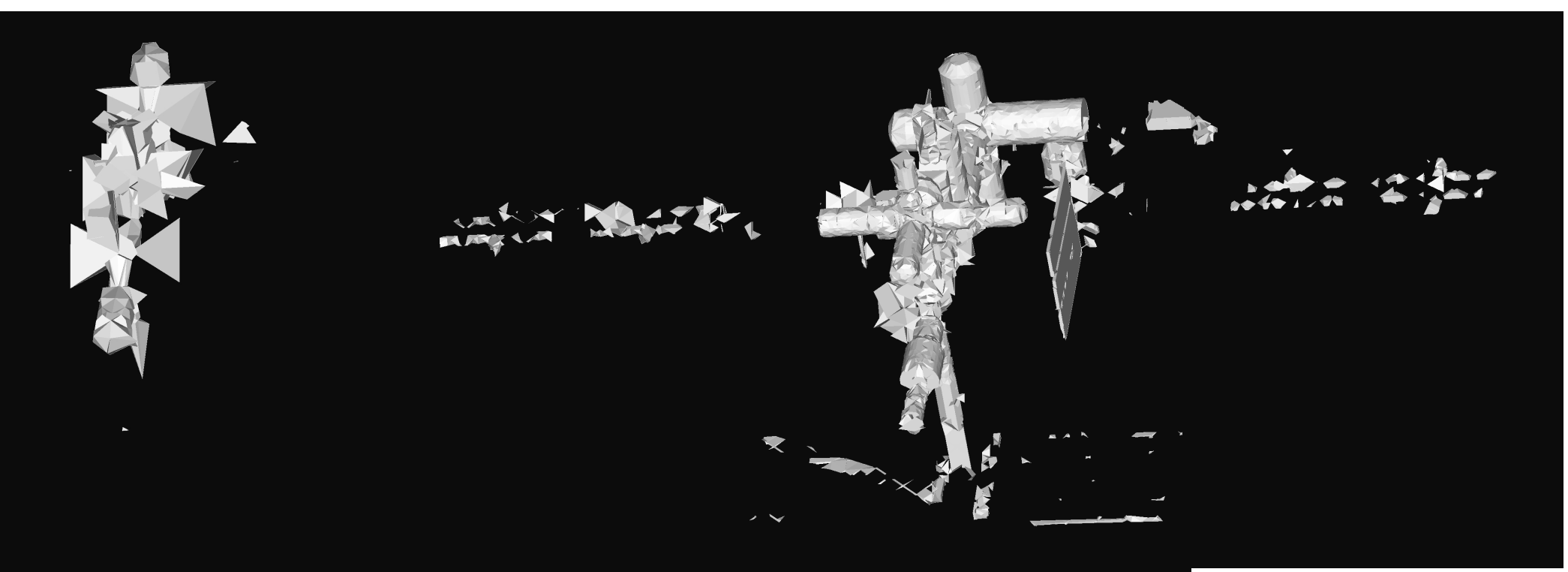
Imprints: Internal faces between different parts

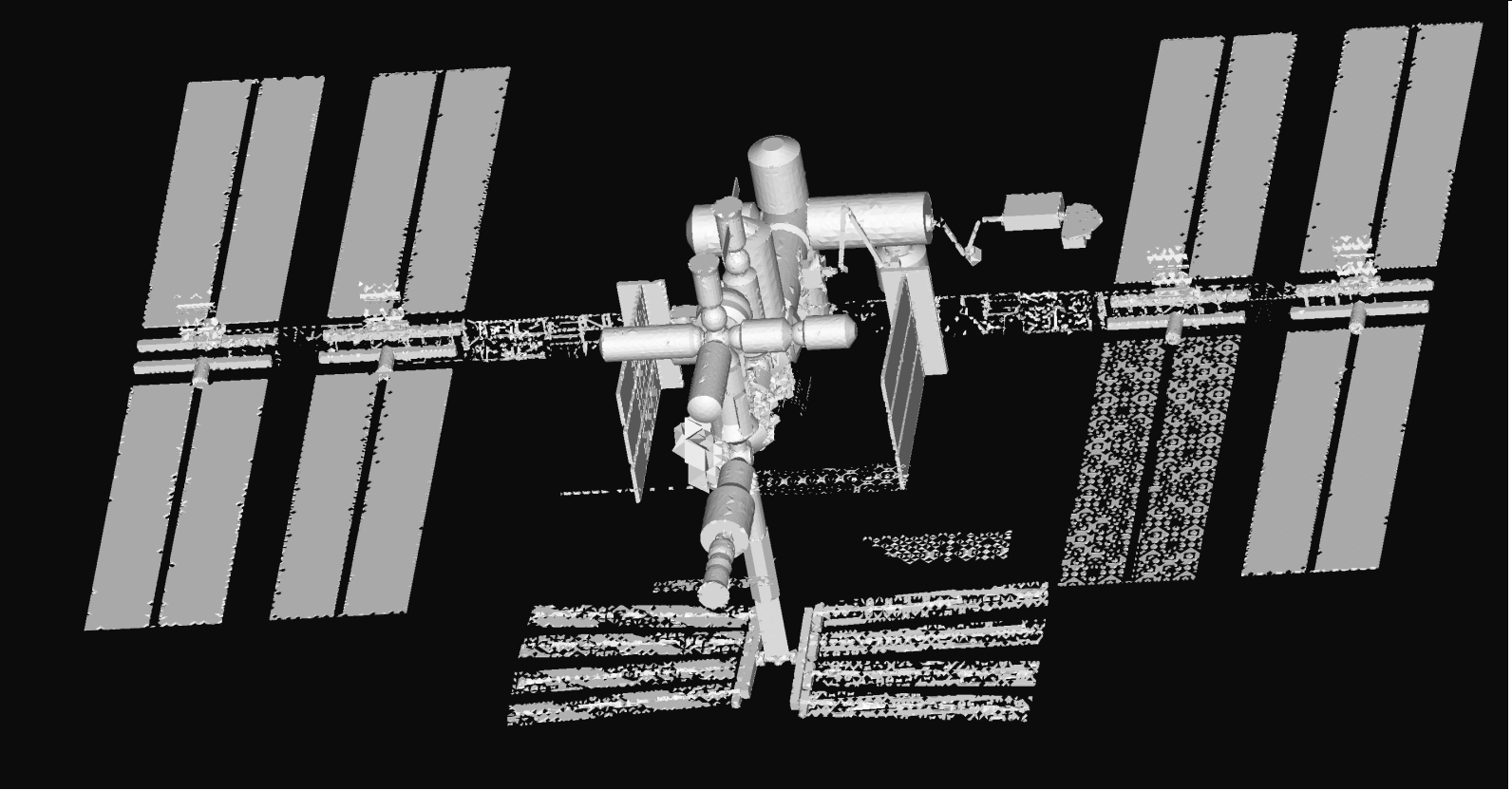


release 7

Three stages of the MMT refinement

Resolution	nodes
4.0	4 993
1.0	57 161
0.25	765 949



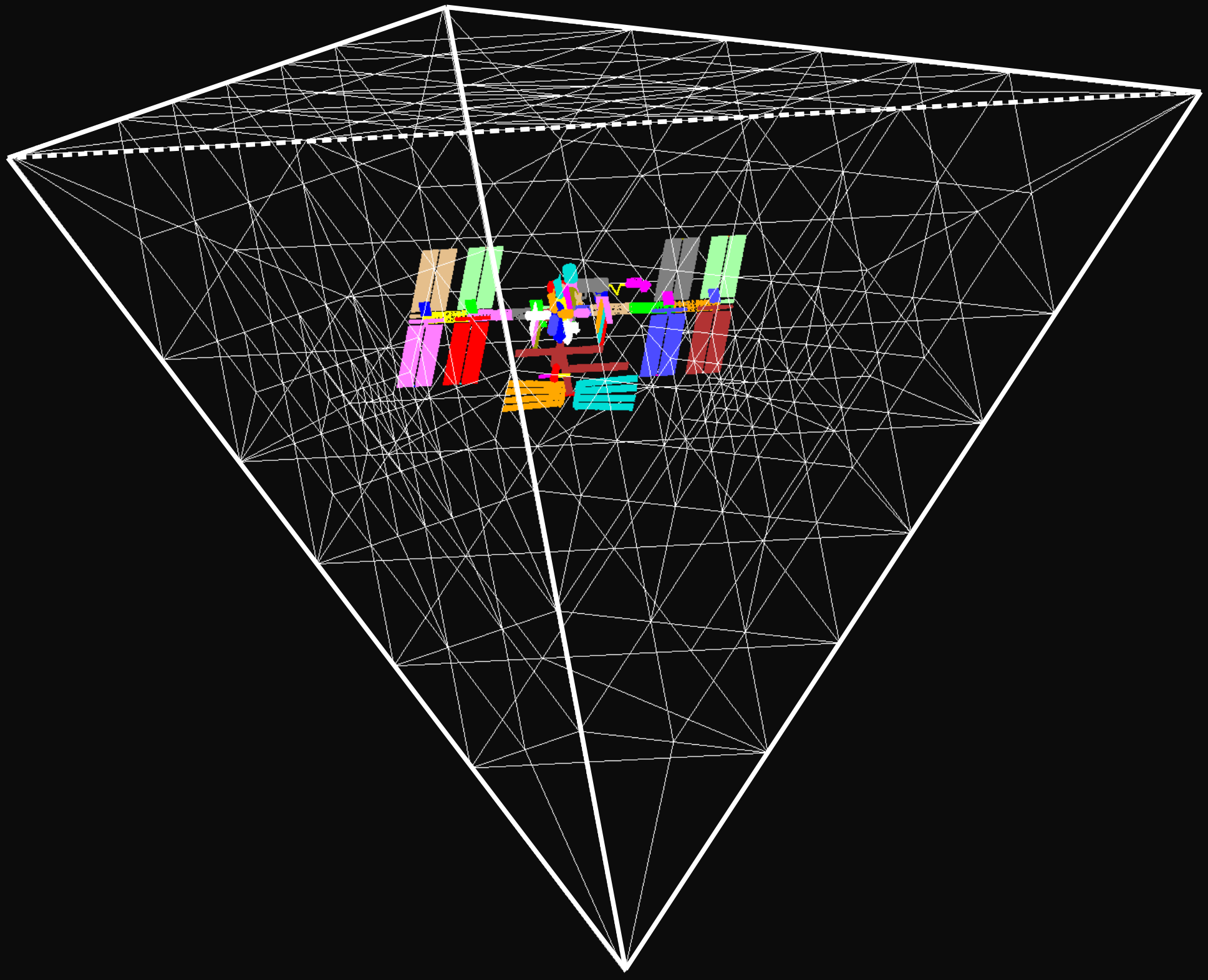


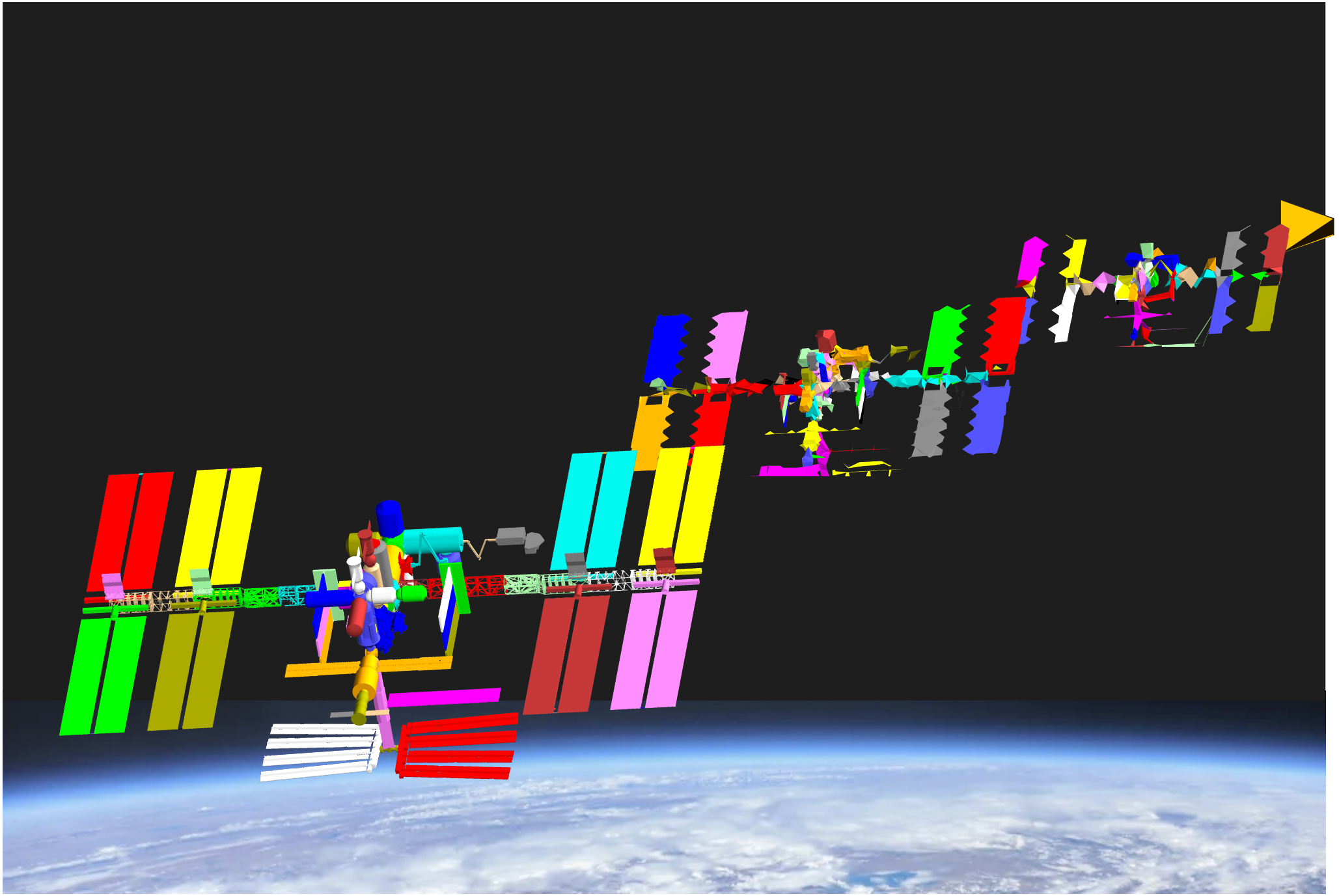
release 9

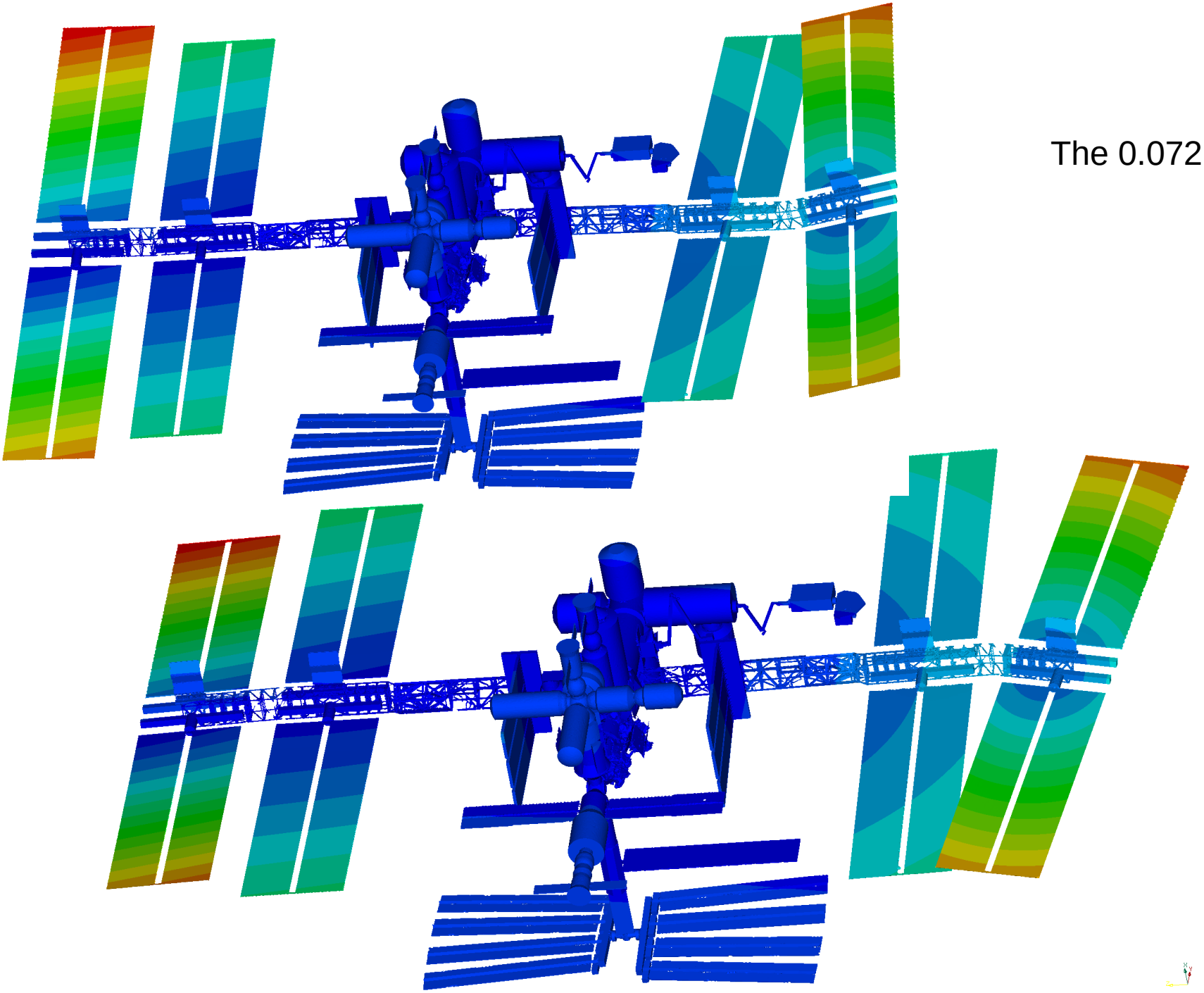
Three stages of the MMT refinement

Refine	Resolution	nodes
12	4.0	612
14	1.0	16 586
16	0.25	390 691

MMT	**release 7**	**release 9**
Basic refinement	locally refined Octree of a large cubic tetra	
Marching Tetra	Edge Bisection	Edge Bi- and Tri- section
Mesh improvement	option	--
Input	10 000 parts	1 part (10 000 parts at release 10)
Boole	subtract	add, subtract, intersection
Date	Oct 2021 NAFEMS Salzburg	Jan 2025







The 0.072 Hz eigenform

some comments on the 0.072 Hz eigenform

Solver	NASTRAN
1	linear material (we could distinguish up to 98 materials)
Geometry	Grabcad
98	parts, not repaired: 2 free edge parts, 18 T-joint parts
17 / 32 / 43	size x - y - z . The size of the ISS is 108 meter.
Meshed	by LFE MMT release 7 (2021)
4 847 262	nodes
2 730 256	TET-10 Elements
0.25	resolution
0.221	average element-quality
3.04e-07	worst element
324	Elements were deleted because NASTRAN regarded them as zero volume elements. (8 columns for node xyz)