



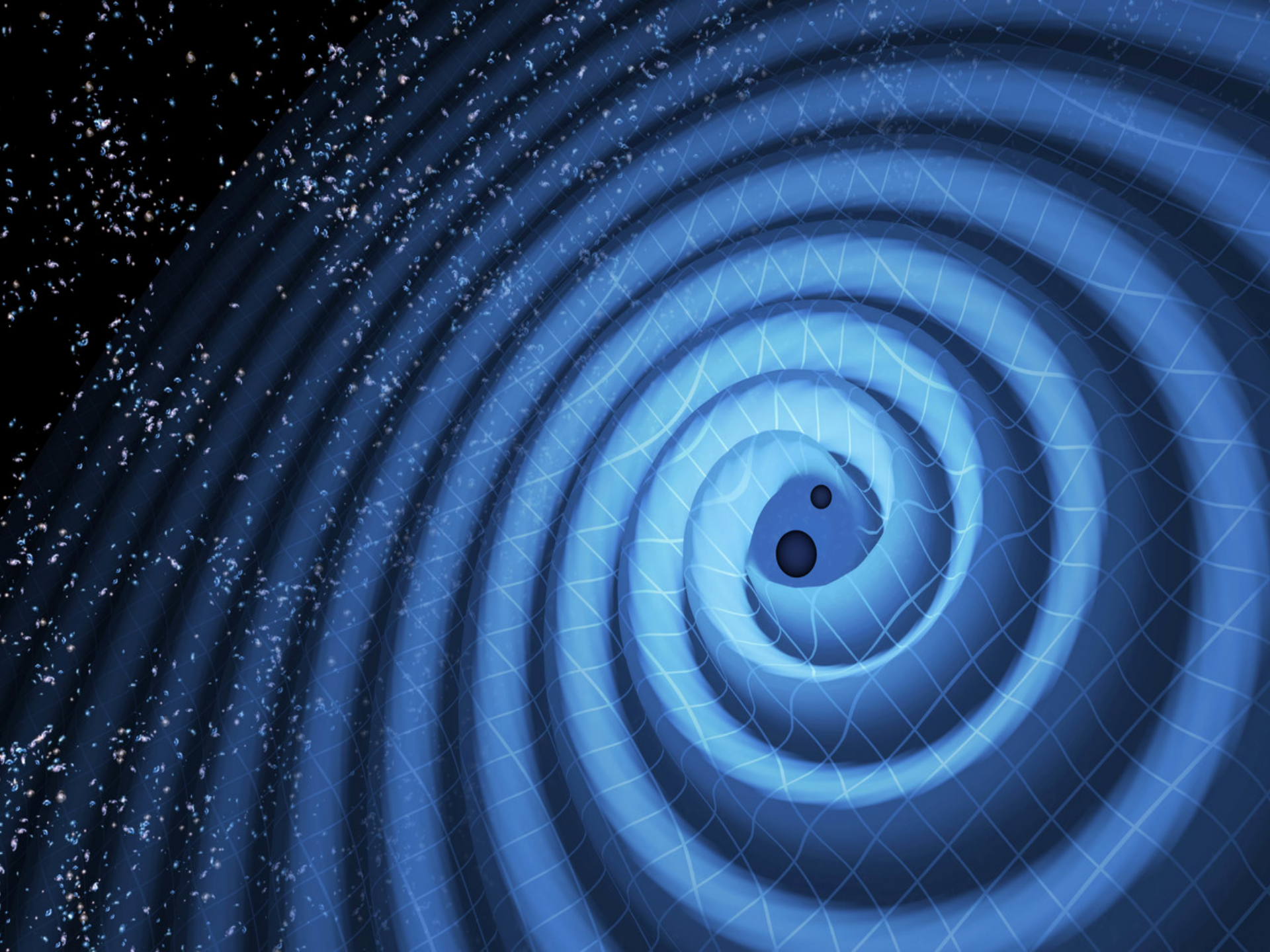
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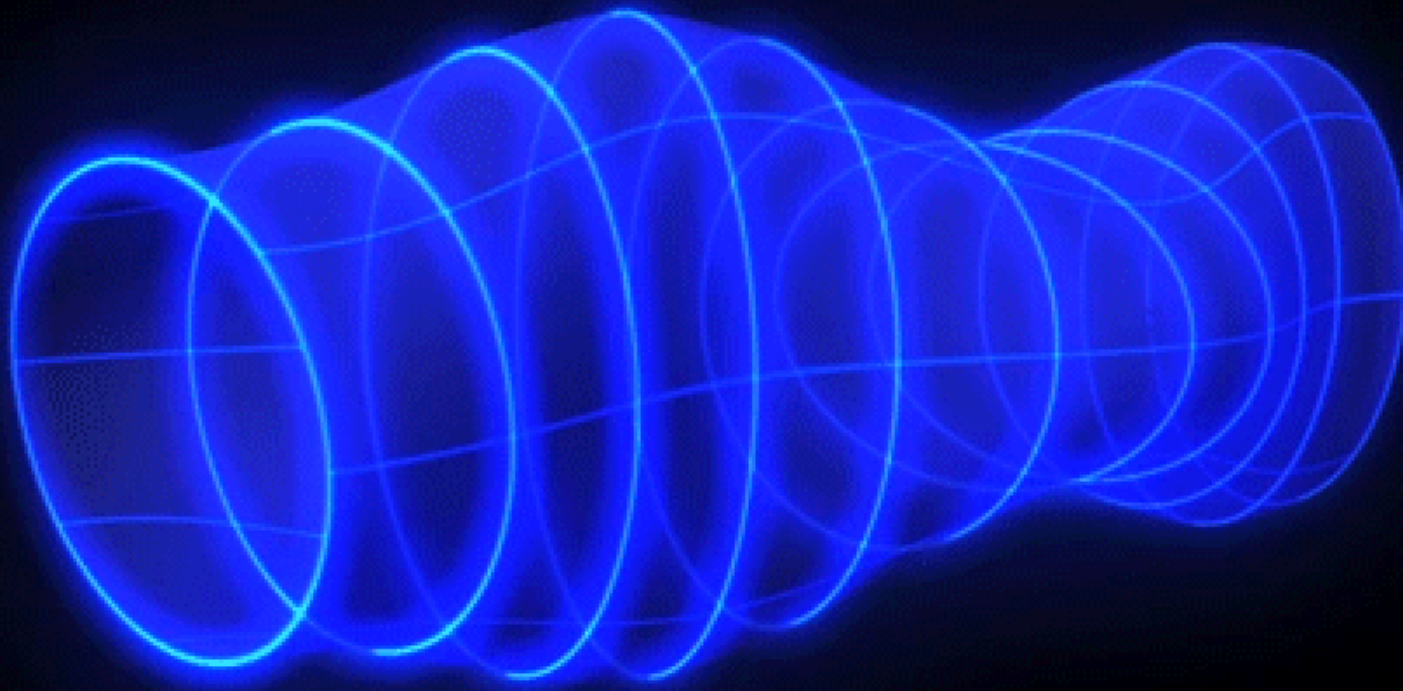
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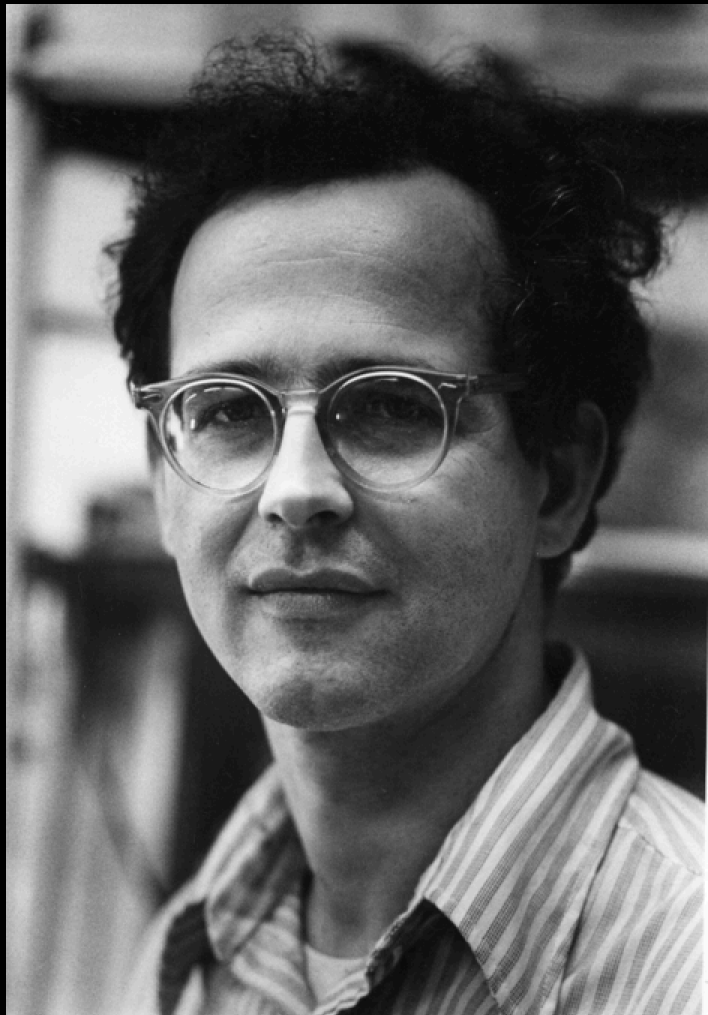
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Rai Weiss, circa 1967



... gravitational wave, and it is assumed that all components of h_{ij} are much smaller than 1. If the plane wave propagates in the x_1 direction, it is always possible to find a coordinate system in which h_{ij} takes the irreducible form

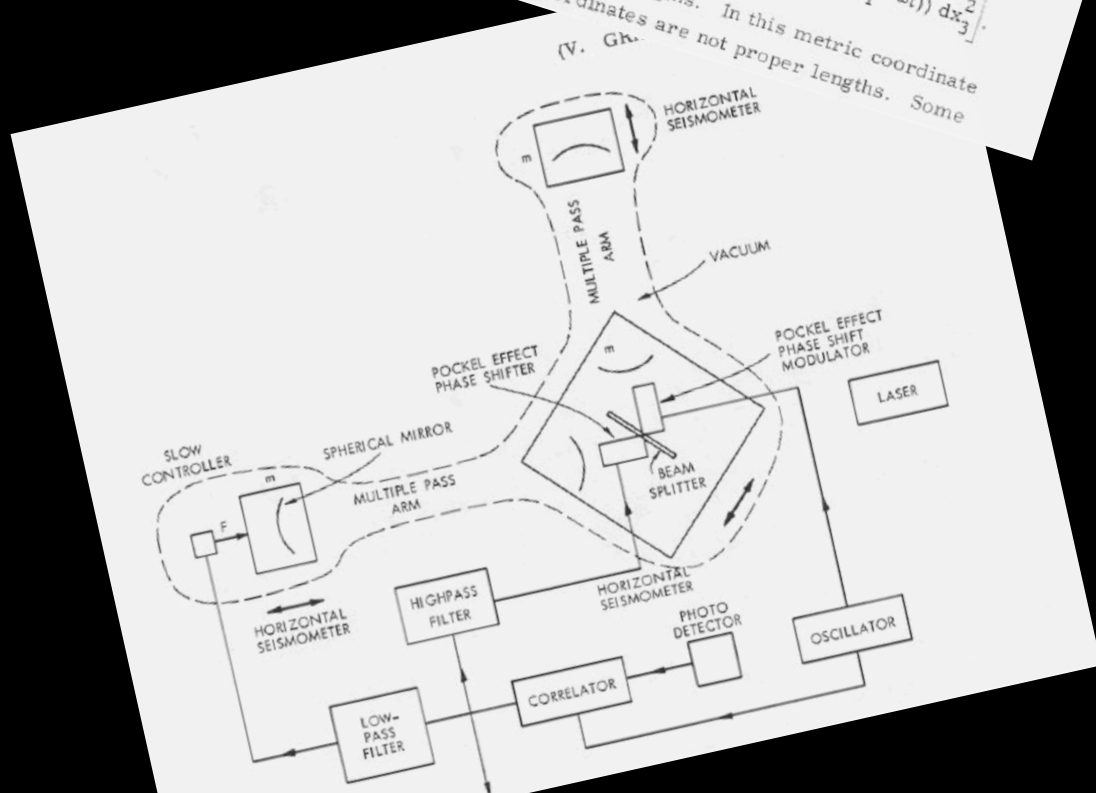
$$h_{ij} = \begin{pmatrix} 0 & & & & & \\ & 0 & & & & \\ & & \ddots & & & \\ & & & h_{22} & h_{23} & \\ & & & h_{32} & h_{33} & \\ & & & & & \ddots \end{pmatrix}$$

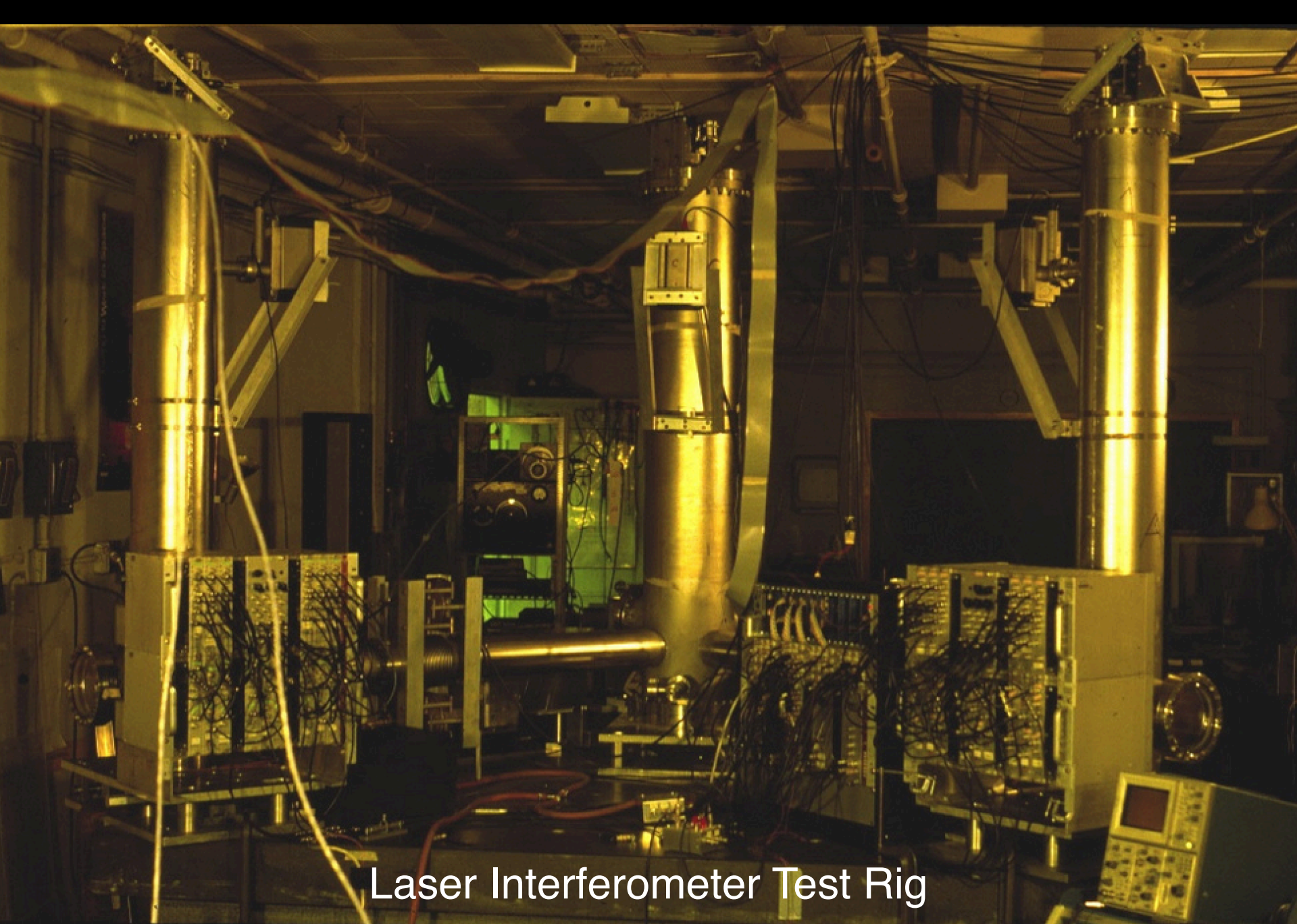
with $h_{22} = -h_{33}$, and $h_{23} = h_{32}$. The tensor components have the usual functional dependence $f(x_1 - ct)$.

To gain some insight into the meaning of a plane gravitational wave, assume that the wave is in the single polarization state $h_{23} = h_{32} = 0$, and furthermore let $h_{22} = -h_{33} = h \sin(kx_1 - \omega t)$. The interval between two neighboring events is then given by

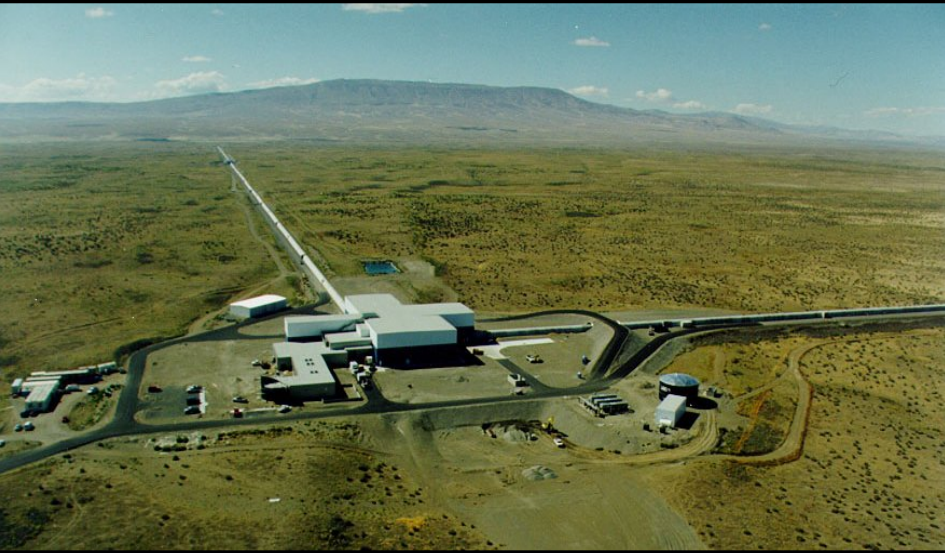
$$ds^2 = g_{ij} dx^i dx^j = c^2 dt^2 - [dx_1^2 + (1 + h \sin(kx_1 - \omega t)) dx_2^2 + (1 - h \sin(kx_1 - \omega t)) dx_3^2].$$

The metric relates coordinate distances to proper lengths. In this metric coordinate time is proper time; however, the spatial coordinates are not proper lengths. Some

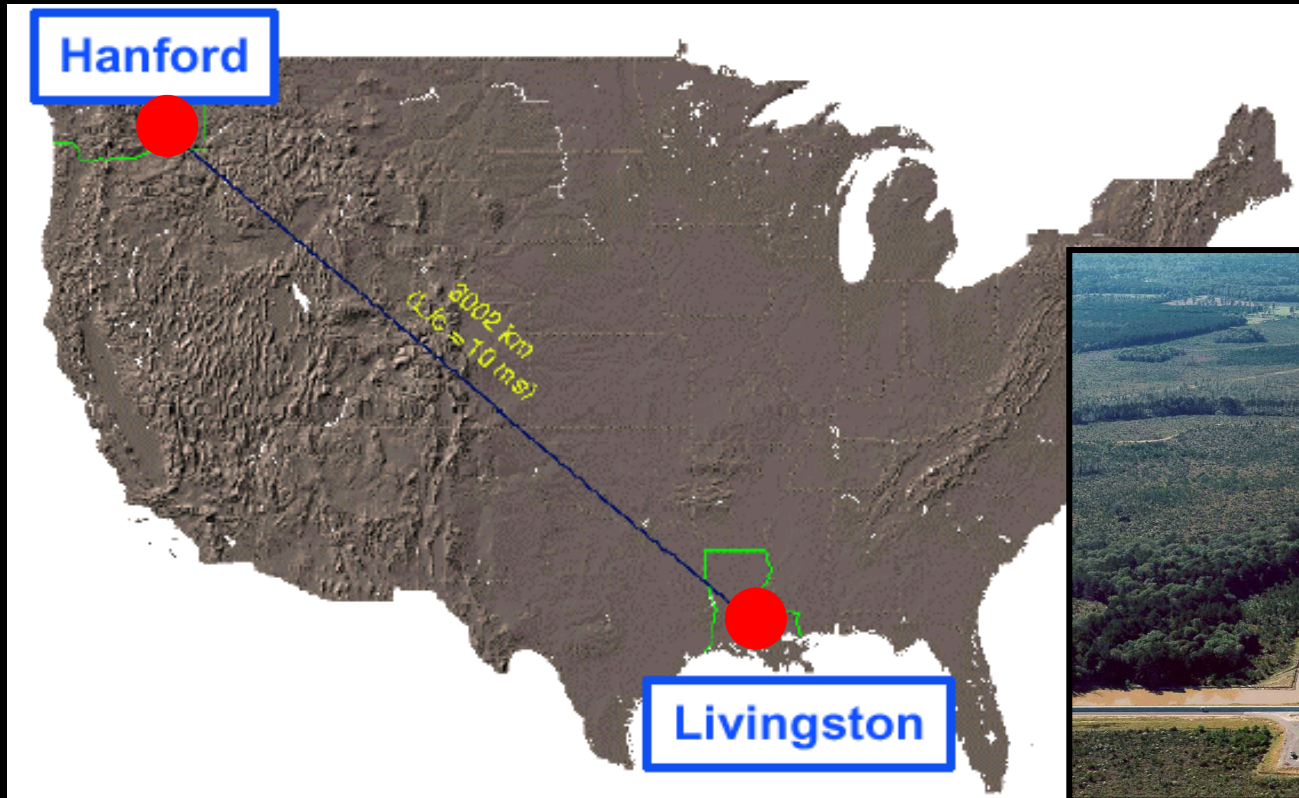




Laser Interferometer Test Rig

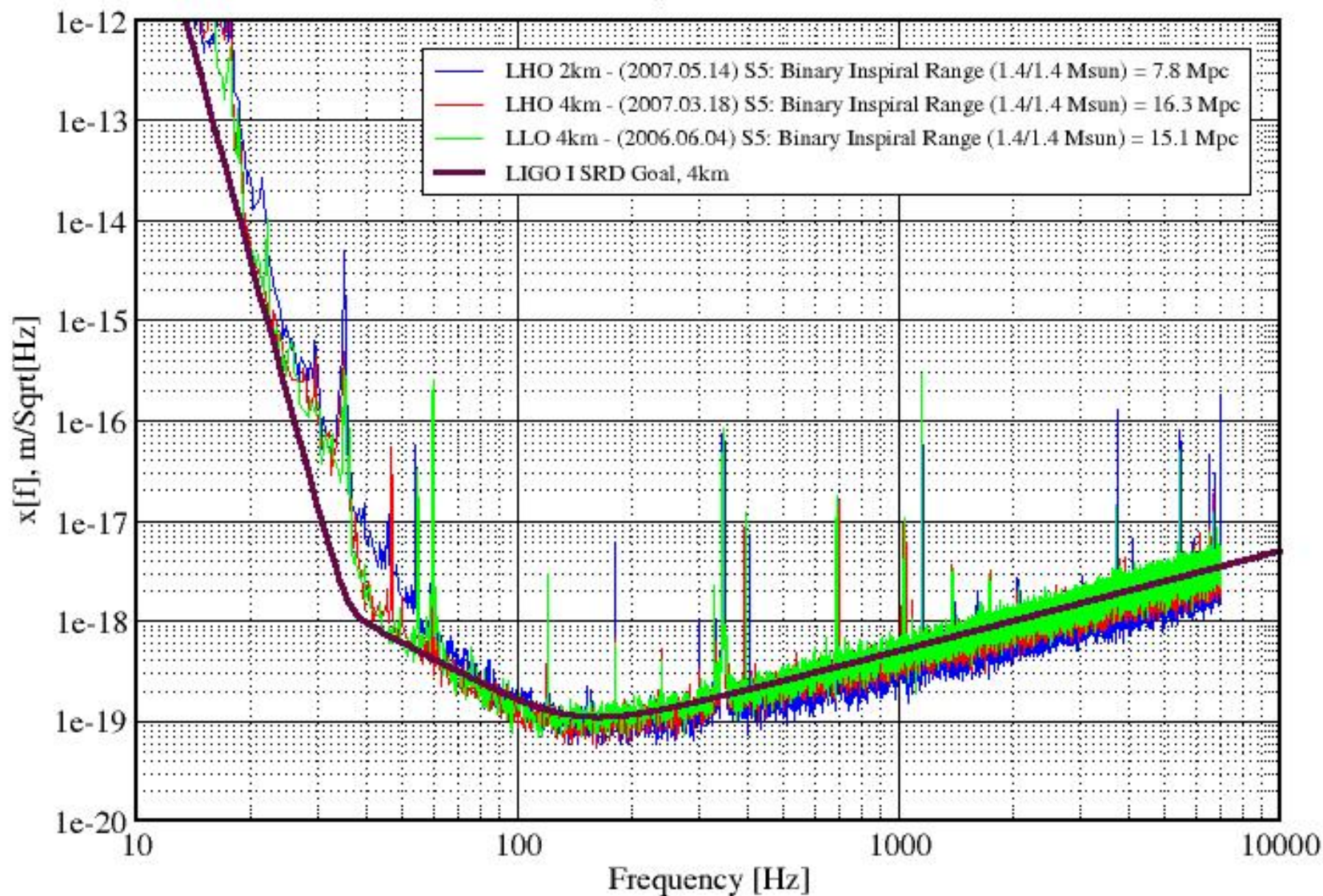


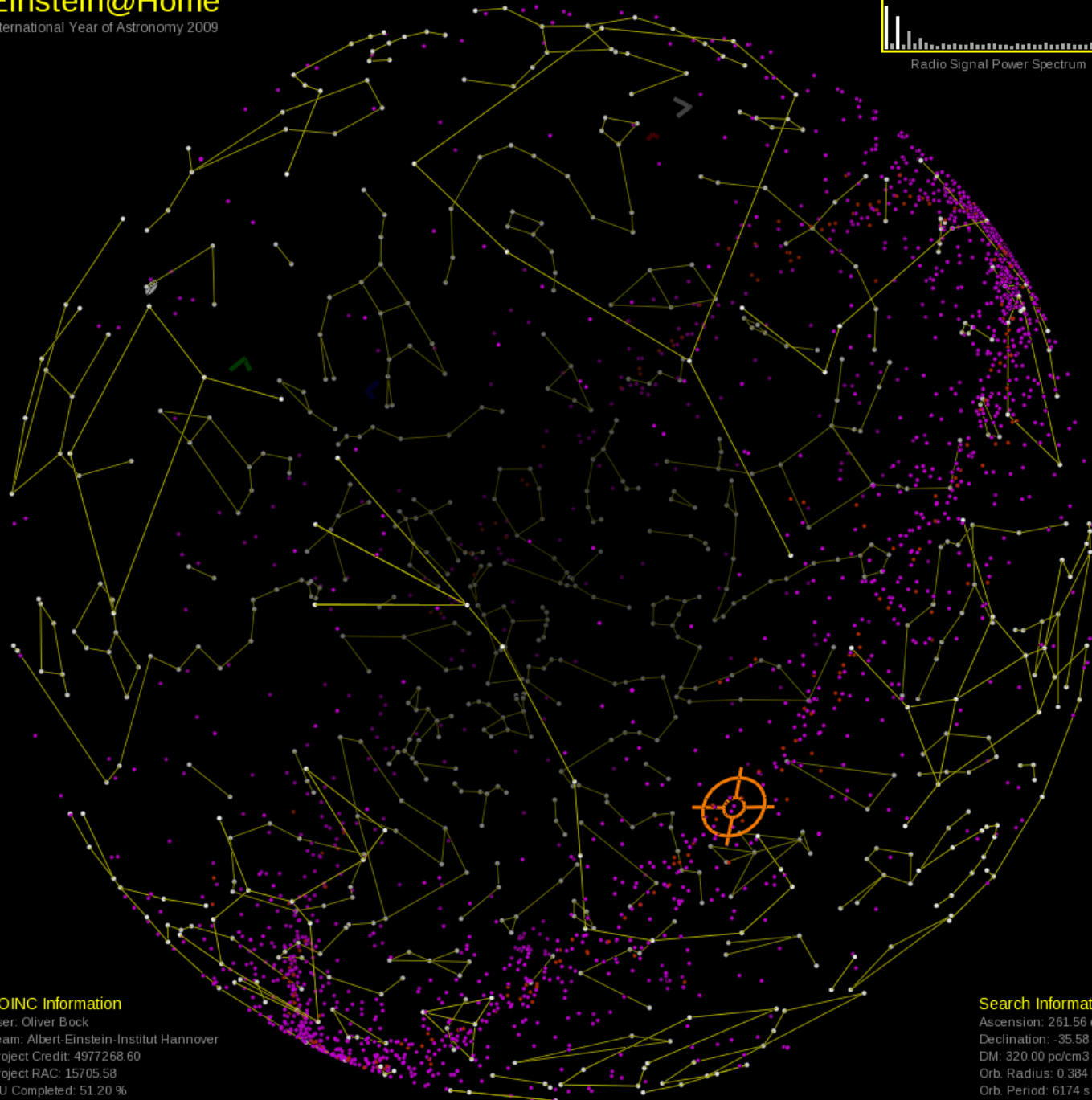
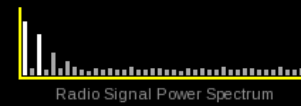
LIGO Laboratory: two Observatories



Displacement Sensitivity of the LIGO Interferometers

Performance for S5 - May 2007 LIGO-G070367-00-E





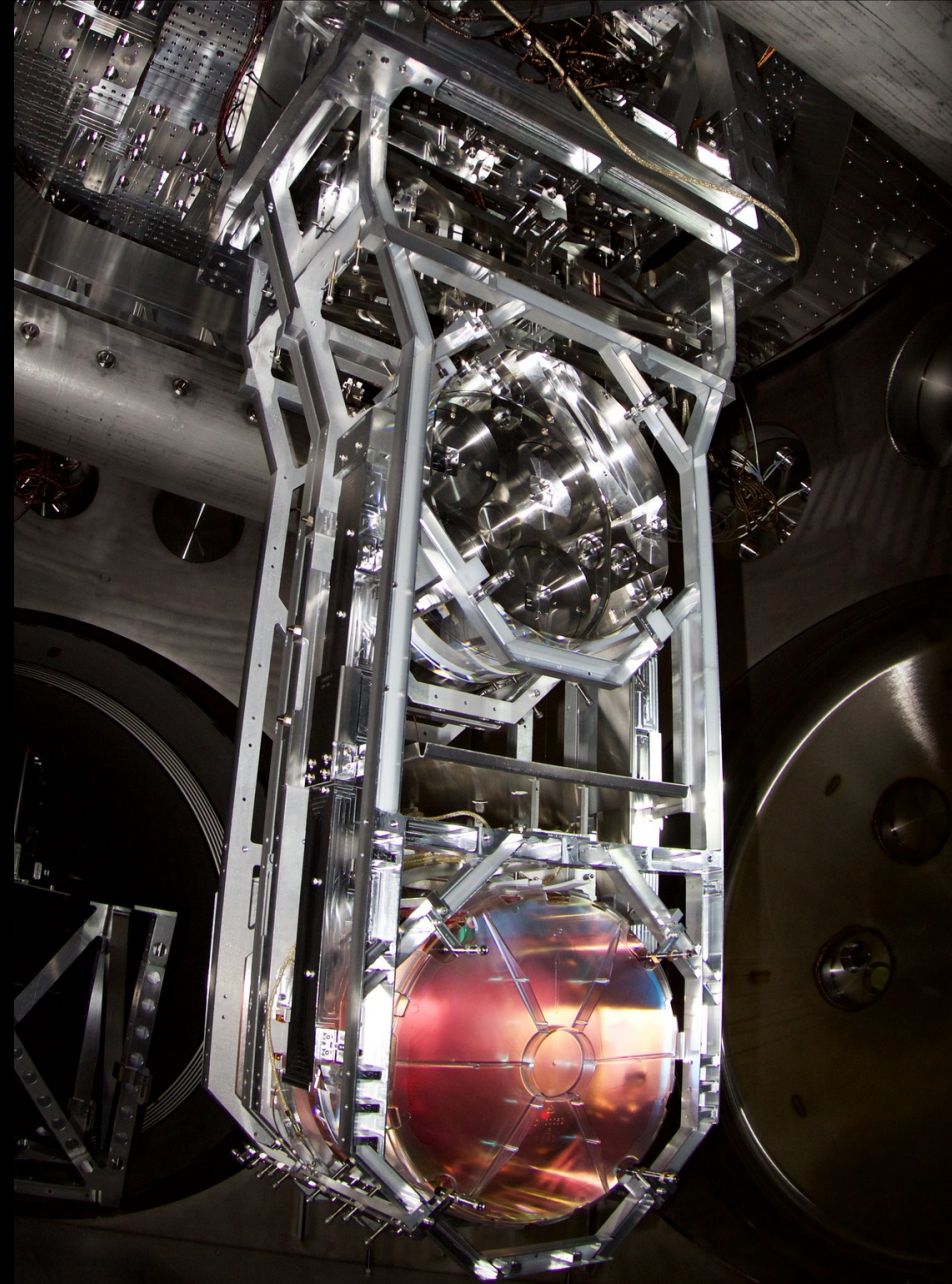
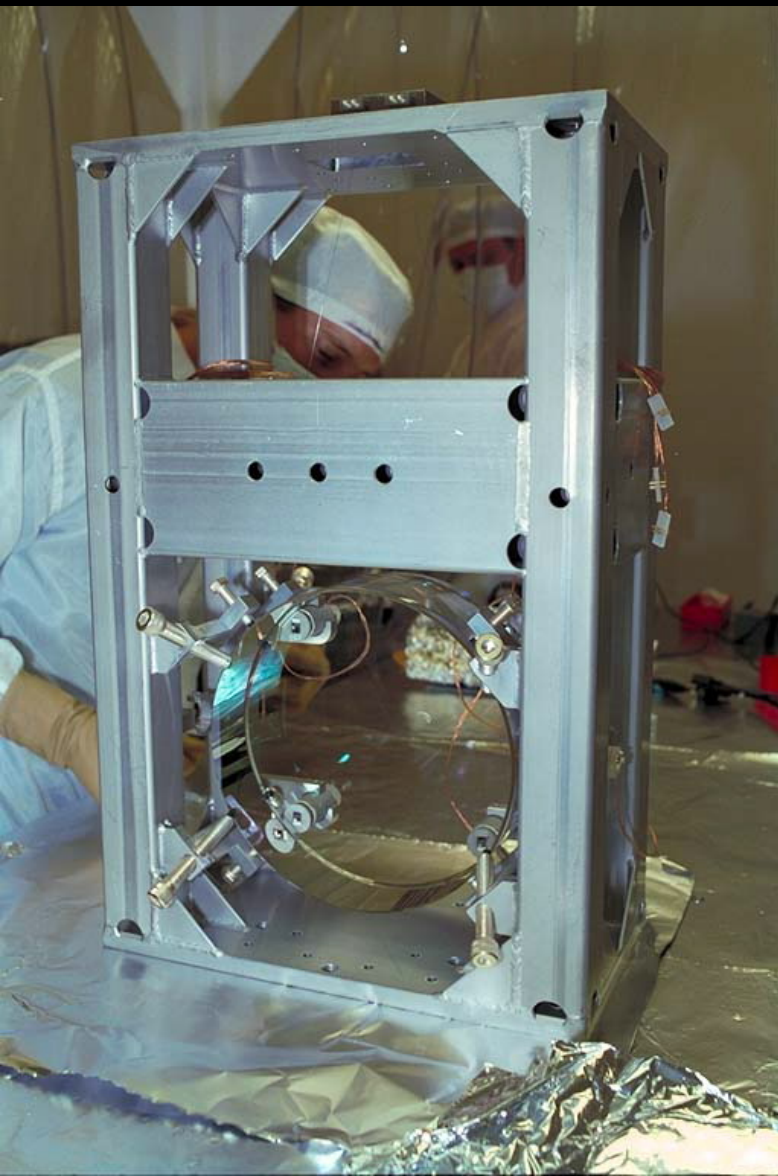
BOINC Information

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Team: Albert-Einstein-Institut Hannover
Project Credit: 4977268.60
Project RAC: 15705.58
WU Completed: 51.20 %
WU CPU Time: 00:02:50

Search Information

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Orb. Period: 6174 s
Orb. Phase: 0.13 rad

Old LIGO...

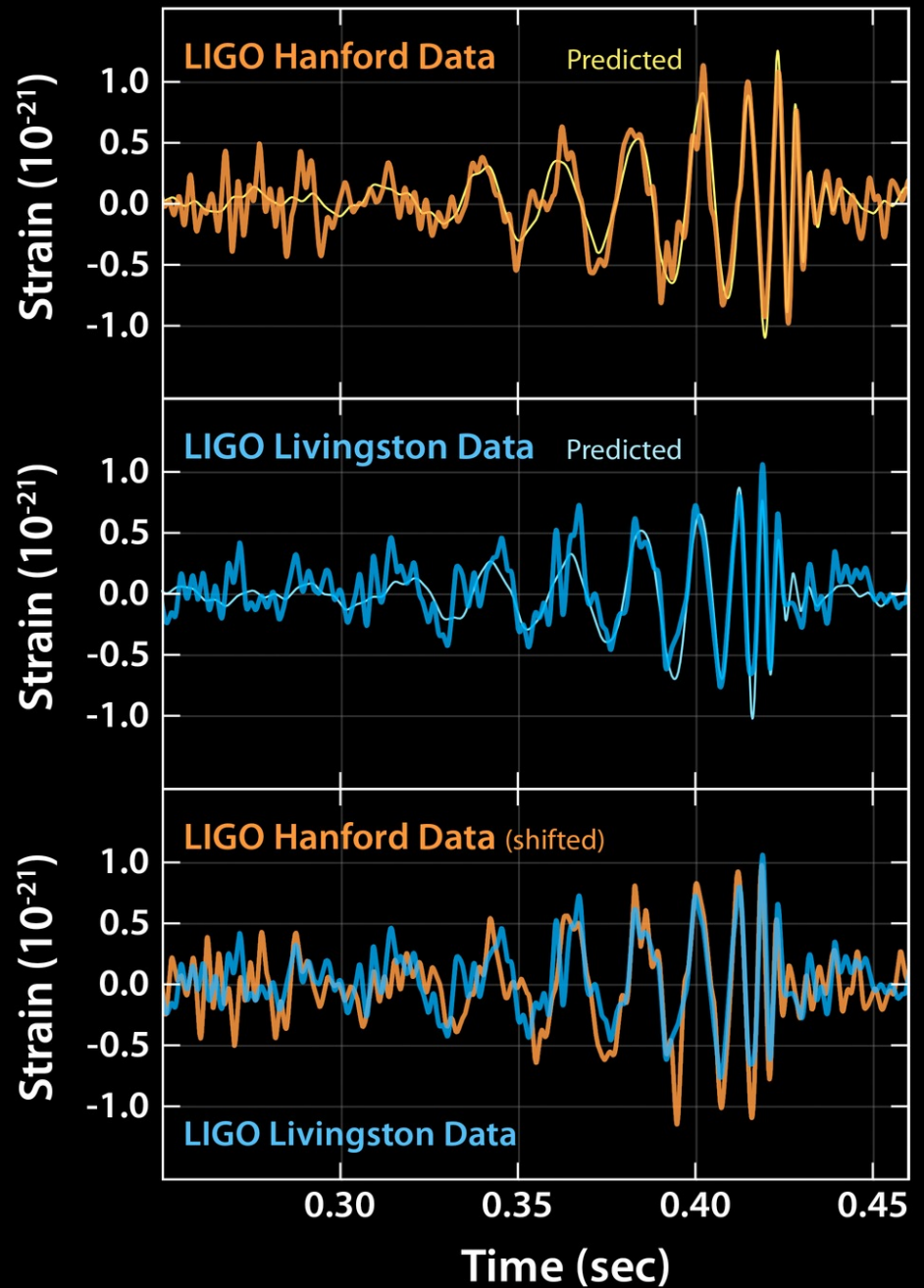


Advanced LIGO !

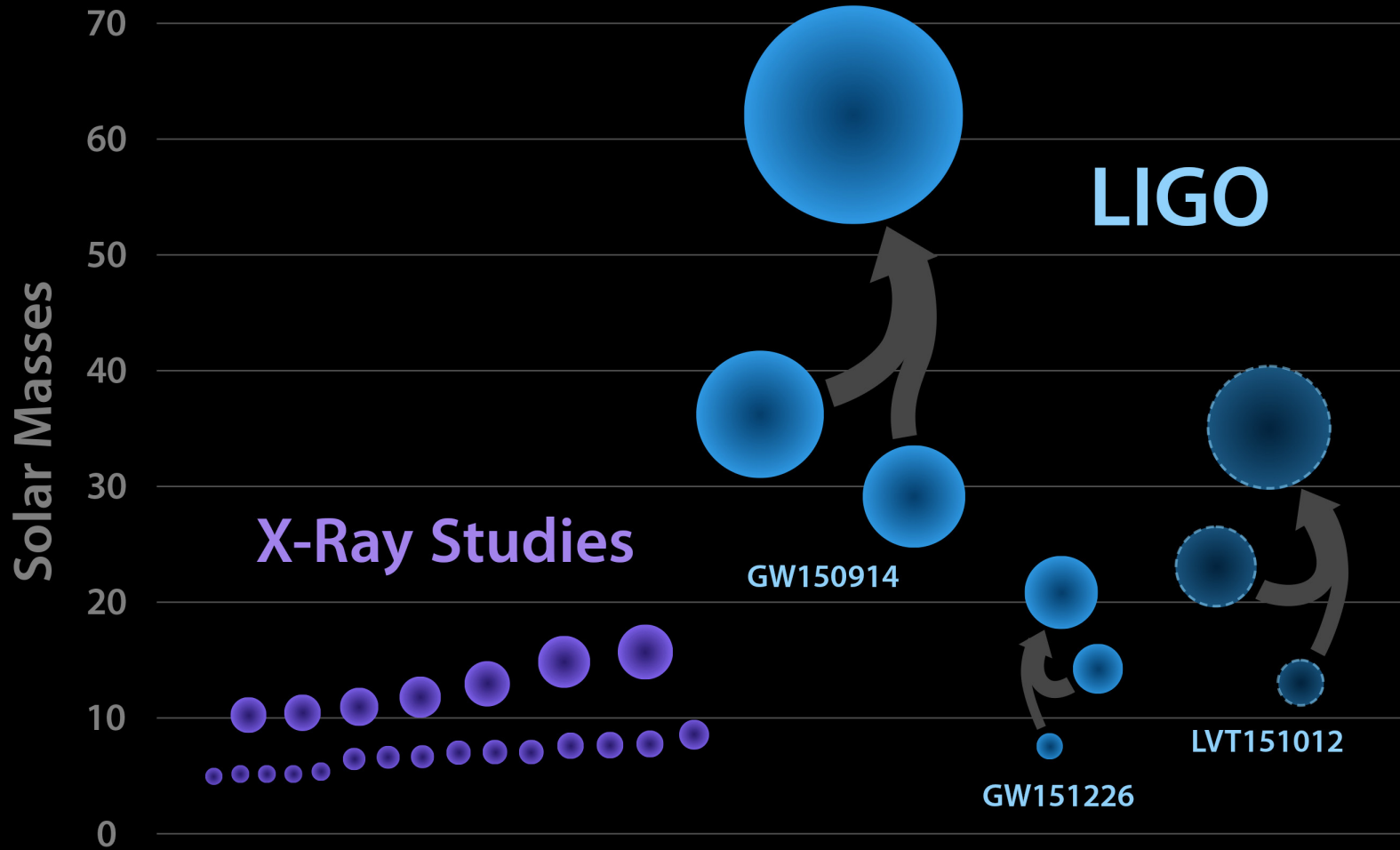


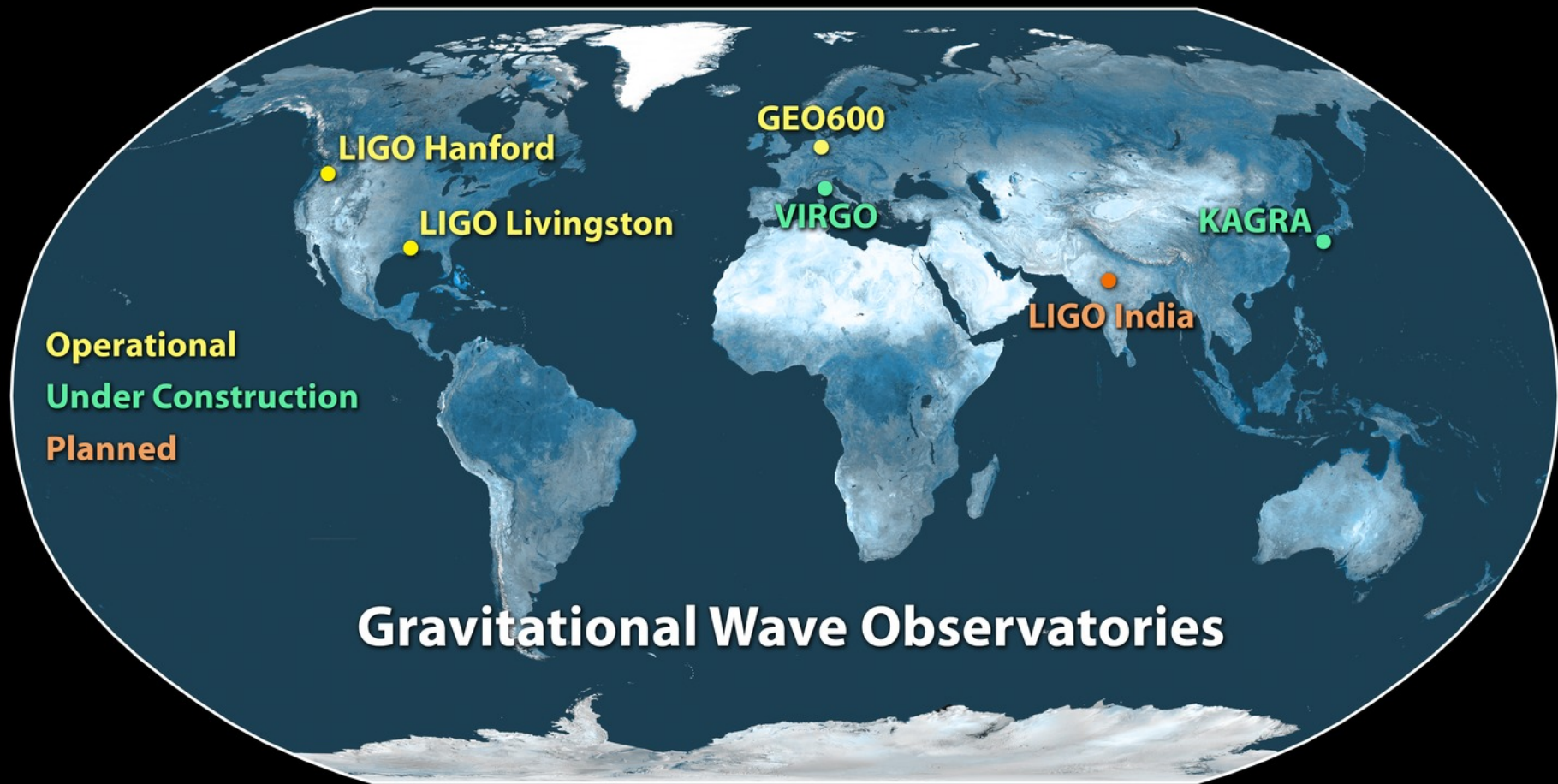
LIGO Control Room

September 14, 2015
at 04:51 CDT:



Black Holes of Known Mass



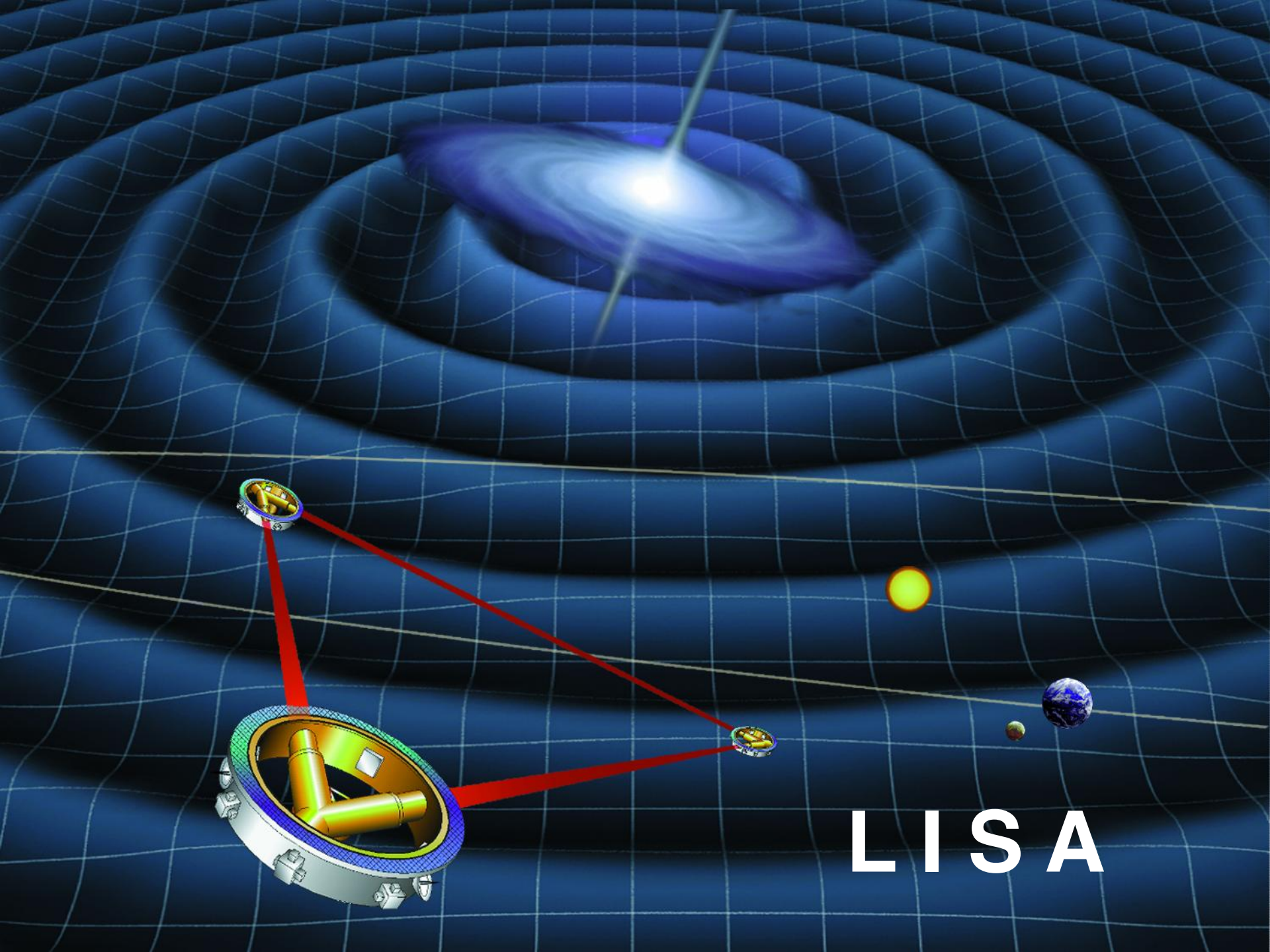


Operational

Under Construction

Planned

Gravitational Wave Observatories



LISA