Answer to Question #70199, Physics / Mechanics | Relativity

Question:

Is it necessary that a mass should be present at the center of mass of any system?

Solution:

No. Let's for instance take a square frame with a mass m. Such a frame will have a center of mas in the middle of the frame, in the empty space. In general the center of mass of any system can be found as

$$\bar{r}_c = \frac{\sum m_i \bar{r}_i}{\sum m_i}$$

where m_i is the mass of the fragment of the body and r_i is the radius vector pointing to this fragment form the origin. In such an equation the presence of m_c on $\bar{r}_c$ is not necessary.

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