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# Incorporating the absolute-absolute space-time-mass and its underlying absolute-absolute intrinsic-intrinsic space-time-mass into physics. Part II.

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We derive the properties of the absolute-absolute spacetime containing the absolute-absolute rest masses of particles and bodies to complement the first part of this paper. We establish the perfect isotropy and consequently the spherical shape of the universal 'three-dimensional' absolute-absolute space $\hat{\hat{\Sigma}}$ and the absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of particles and bodies contained in it, relative to 3-observers in the relativistic Euclidean 3-space $\Sigma$, but that $\hat{\hat{\Sigma}}$ naturally contracts to a universal 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$ containing lines of absolute-absolute rest masses of particles and bodies, where $\hat{\hat{\rho}}$ has no unique orientation in $\Sigma$ relative to 3-observers in $\Sigma$. We show further that the universal spherical absolute-absolute space $\hat{\hat{\Sigma}}$ effectively contains a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point of it and is without a unique center, but must be replaced by the universal isotropic 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$ with no unique base (or origin), containing a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point along its length, relative to 3-observers in $\Sigma$. We also show that the universal absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ is perfectly homogeneous relative to 3-observers in $\Sigma$. We show that the concepts of co-moving coordinates (or frames), 'everywhereness' and simultaneity obtain in the absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ and its underlying absolute-absolute intrinsic-intrinsic spacetime $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$, relative to 3-observers in relativistic Euclidean 3-space $\Sigma$. Finally we demonstrate the impossibility (or non-existence) of absolute-absolute natural laws of physics in the absolute-absolute spacetime relative to observers in spacetime.

## 1 Properties of the absolute-absolute spacetime and absolute-absolute intrinsic-intrinsic spacetime relative to 3-observers in the relativistic Euclidean 3-space

### *1.1 Isotropy of absolute-absolute space and absolute-absolute intrinsic-intrinsic space with respect to 3-observers in the physical Euclidean 3-space*

The deduction of the isotropy of the absolute-absolute space and absolute-absolute intrinsic-intrinsic space with respect to 3-observers in the relativistic Euclidean 3-space $\Sigma$, to be done here, takes on exactly the same form as the deduction of the isotropy of the absolute space and absolute intrinsic space with respect to 3-observers in $\Sigma'$ or $\Sigma$, done in sub-section 4.7 of [1].

Now the absolute-absolute space is a 'three-dimensional' domain $\hat{\hat{\Sigma}}$ with respect to the absolute-absolute-rest-mass-observers (or simply '3-observers') in it. The absolute-absolute intrinsic-intrinsic space is likewise a 'three-dimensional' domain $\phi\phi\hat{\hat{\Sigma}}$ with respect to the absolute-absolute-intrinsic-intrinsic-rest-mass-observers (or '3-observers') in it. However every pair of distinct directions in the 'three-dimensional' absolute-absolute space $\hat{\hat{\Sigma}}$, which are separated by non-zero absolute-absolute Euler angles $\hat{\hat{\alpha}}$, $\hat{\hat{\beta}}$ and $\hat{\hat{\gamma}}$, with respect to '3-observers' in $\hat{\hat{\Sigma}}$, are separated by zero magnitude of the corresponding absolute angles, that is, by ($\hat{\alpha} = 0, \hat{\beta} = 0, \hat{\gamma} = 0$), since any magnitude of an absolute-absolute angle $\hat{\hat{\theta}}$ in $\hat{\hat{\Sigma}}$, is equivalent to zero magnitude of the absolute angle $\hat{\theta}$ in $\hat{\Sigma}$, which follows from, $\phi\phi\hat{\hat{\theta}} \equiv 0 \times \phi\hat{\theta}$, hence $\hat{\hat{\theta}} \equiv 0 \times \hat{\theta}$.

It follows from the foregoing paragraph that every pair of distinct directions in the 'three-dimensional' absolute-absolute space $\hat{\hat{\Sigma}}$ with respect to '3-observers' in it, are absolutely the same direction with respect to '3-observers' in the absolute space $\hat{\Sigma}$ and 3-observers in the relative Euclidean 3-space $\Sigma'$ or $\Sigma$. The absolute-absolute space $\hat{\hat{\Sigma}}$ is therefore perfectly isotropic with respect to 3-observers in $\hat{\Sigma}$, $\Sigma'$ and $\Sigma$.

Moreover since all directions in $\hat{\hat{\Sigma}}$ are absolutely the same with respect to 3-observers in $\Sigma$, the orthogonal coordinate systems in $\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\hat{\hat{\Sigma}}$, are impossible with respect to 3-observers in $\Sigma$. Rather the three mutually orthogonal 'dimensions' of $\hat{\hat{\Sigma}}$ with respect to '3-observers' in it, are aligned along a singular non-unique direction in $\hat{\hat{\Sigma}}$, thereby constituting a 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$, with no unique orientation in $\hat{\hat{\Sigma}}$ and hence no unique orientation in the relativistic Euclidean 3-space $\Sigma$ (into which $\hat{\hat{\Sigma}}$ is embedded), with respect to 3-observers in $\Sigma$. The 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$ is therefore an isotropic 'dimension' in $\Sigma$ with respect to 3-observers in $\Sigma$.

Likewise every pair of distinct directions in the 'three-dimensional' absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in it, which are separated by non-zero absolute-absolute intrinsic-intrinsic Euler angles $\phi\phi\hat{\hat{\alpha}}$, $\phi\phi\hat{\hat{\beta}}$ and $\phi\phi\hat{\hat{\gamma}}$ with respect to 3-observers in $\phi\phi\hat{\hat{\Sigma}}$, are separated by zero corresponding absolute Euler angles ($\hat{\alpha} = 0, \hat{\beta} = 0, \hat{\gamma} = 0$), since any magnitude of an absolute-absolute intrinsic-intrinsic angle $\phi\phi\hat{\hat{\theta}}$ is equivalent to zero magnitude of absolute intrinsic angle, from $\phi\phi\hat{\hat{\theta}} \equiv 0 \times \phi\hat{\theta}$. Consequently any magnitude of $\phi\phi\hat{\hat{\theta}}$ is equivalent to zero magnitude of $\hat{\theta}$, since zero magnitude of $\phi\hat{\theta}$ implies zero magnitude of $\hat{\theta}$.

It again follows from the foregoing paragraph that every pair of distinct directions in the ‘three-dimensional’ absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$ with respect to ‘3-observers’ in it, are absolutely the same direction with respect to 3-observers in the relativistic Euclidean 3-space $\Sigma$. The absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$ is therefore absolutely isotropic with respect to 3-observers in $\Sigma$. It then follows that mutually orthogonal coordinate systems in $\phi\phi\hat{\hat{\Sigma}}$ with respect to ‘3-observers’ in $\phi\phi\hat{\hat{\Sigma}}$, are impossible with respect to 3-observers in $\Sigma$. Rather the three mutually orthogonal ‘dimensions’ of $\phi\phi\hat{\hat{\Sigma}}$ are aligned along the same direction, thereby constituting a ‘one-dimensional’ absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$, with no unique orientation in $\phi\phi\hat{\hat{\Sigma}}$ and hence no unique orientation in $\Sigma$ overlying $\phi\phi\hat{\hat{\Sigma}}$, with respect to 3-observers in $\Sigma$. The ‘one-dimensional’ absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$ constitutes an isotropic absolute-absolute intrinsic-intrinsic ‘dimension’ underlying $\Sigma$ with respect to 3-observers in $\Sigma$.

The diagram of Fig. 3c or Fig. 4 of part one of this paper [2], in which the absolute-absolute space is shown as an isotropic absolute-absolute space ‘dimension’ $\hat{\hat{\rho}}$ embedded in the relativistic Euclidean 3-space $\Sigma$ with respect to 3-observers in $\Sigma$, and the absolute-absolute intrinsic-intrinsic space is shown as an isotropic absolute-absolute intrinsic-intrinsic space ‘dimension’ $\phi\phi\hat{\hat{\rho}}$ underlying the relativistic intrinsic space $\phi\rho$ with respect to 3-observers in $\Sigma$, has thus been justified. As a matter of fact, the absolute-absolute intrinsic-intrinsic space has been shown as an isotropic absolute-absolute intrinsic-intrinsic ‘dimension’ $\phi\phi\hat{\hat{\rho}}$ underlying the proper intrinsic space $\phi\rho'$ underneath $\Sigma'$ or underlying the relativistic intrinsic space $\phi\rho$ underneath $\Sigma$, since its isolation and incorporation into the diagrams in [3].

### *1.2 Homogeneity of absolute-absolute space and absolute-absolute intrinsic-intrinsic space with respect to 3-observers in the physical Euclidean 3-space*

The universal flat (or Euclidean) ‘thee-dimensional’ absolute-absolute space $\hat{\hat{\Sigma}}$ with respect to ‘3-observers’ in it, contains the ‘three-dimensional’ absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of varying magnitudes, shapes and sizes, of all particles and bodies in the universe, which are scattered arbitrarily in $\hat{\hat{\Sigma}}$ with respect to ‘3-observers’ in $\hat{\hat{\Sigma}}$. The elusive rest masses $m_0$, $M_0$ of identical magnitudes, shapes and sizes as $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$, of all particles and bodies in the universe, are scattered arbitrarily in the elusive proper Euclidean 3-space $\Sigma'$, exactly like $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ in $\hat{\hat{\Sigma}}$. The observed inertial masses $m$, $M$ of identical shapes but slightly different magnitudes and sizes as $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$, of all particles and bodies in the universe, are likewise scattered arbitrarily in the observed relativistic Euclidean 3-space $\Sigma'$, exactly like $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ in $\hat{\hat{\Sigma}}$.

However the universal absolute-absolute space is an isotropic ‘dimension’ $\hat{\hat{\rho}}$ (with no unique orientation) in $\Sigma$, containing ‘one-dimensional’ absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of all particles and bodies in the universe, which are non-uniformly aligned along $\hat{\hat{\rho}}$ with respect to 3-observers in $\Sigma$, as deduced in the preceding sub-section. As illustrated in Fig. 3c of part one of this paper [2], the 'one-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of particles and bodies in $\hat{\hat{\rho}}$, are embedded in the three-dimensional inertial masses $m$, $M$ of the particles and bodies in $\Sigma$, with respect to 3-observers in $\Sigma$.

The 'one-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ in $\hat{\hat{\rho}}$ with respect to 3-observers in $\Sigma$, have the same magnitudes as the 'three-dimensional' absolute-absolute rest masses in the 'three-dimensional' absolute-absolute space $\hat{\hat{\Sigma}}$, which '3-observers' in $\hat{\hat{\Sigma}}$ observe. They occupy intervals $\hat{\hat{r}}_0$ and $\hat{\hat{R}}_0$ respectively of $\hat{\hat{\rho}}$ within the inertial masses $m$ and $M$ in $\Sigma$. The 'lengths' $\hat{\hat{r}}_0$ and $\hat{\hat{R}}_0$ along the isotropic $\hat{\hat{\rho}}$ must be calculated as the radii of the equivalent spherical $\hat{\hat{m}}_0$ and $\hat{\hat{M}}_0$ in $\hat{\hat{\Sigma}}$ in the case of non-spherical $\hat{\hat{m}}_0$ and $\hat{\hat{M}}_0$ with respect to '3-observers' in $\hat{\hat{\Sigma}}$.

Now any magnitude of an absolute-absolute rest mass $\hat{\hat{m}}_0$ is equivalent to zero magnitude of absolute rest mass ($\hat{m}_0 = 0$). This follows from $\phi\phi\hat{\hat{m}}_0 \equiv 0 \times \phi\hat{m}_0$, hence $\hat{\hat{m}}_0 \equiv 0 \times \hat{m}_0$. Thus an absolute-absolute rest mass $\hat{\hat{m}}_0$ of any magnitude is an absolute zero rest mass, which can be described as an absolutely massless entity (or an absolutely immaterial entity), with respect to 3-observers in $\Sigma$.

Likewise the intervals $\hat{\hat{r}}_0$ and $\hat{\hat{R}}_0$ of $\hat{\hat{\rho}}$ of varying magnitudes, which the 'one-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$ or $\hat{\hat{M}}_0$ of particles and bodies occupy along $\hat{\hat{\rho}}$, are each equivalent to zero interval of absolute space, ($\hat{r}_0 = 0$) or ($\hat{R}_0 = 0$), from $\hat{\hat{r}}_0 = 0 \times \hat{r}_0$. Thus $\hat{\hat{r}}_0$ or $\hat{\hat{R}}_0$ of any magnitude is zero interval of absolute space $\hat{\hat{\rho}}$ and absolute zero interval of the relativistic Euclidean 3-space $\Sigma$ with respect to 3-observers in $\Sigma$. It follows from this and the foregoing paragraph that the isotropic universal 'one-dimensional' absolute-absolute space (or 'dimension') $\hat{\hat{\rho}}$ with respect to 3-observers in $\Sigma$, contains an absolutely massless (or an absolutely immaterial) 'particle' with absolute zero rest mass (that occupies absolute zero interval of 3-space $\Sigma$), which are non-uniformly distributed along $\hat{\hat{\rho}}$, with respect to 3-observers in the universal relativistic Euclidean 3-space $\Sigma$.

However even an empty point in $\hat{\hat{\rho}}$, which is devoid of absolute-absolute rest mass $\hat{\hat{m}}_0$ or $\hat{\hat{M}}_0$ of a particle or body, that is, which contains zero absolute-absolute rest mass ($\hat{\hat{m}}_0 = 0$), can still be described as containing absolute zero rest mass (or as an absolutely massless point), (occupying absolute zero length of 3-space $\Sigma$) with respect to 3-observers in $\Sigma$. It follows from this and the discussion above that the spherical universal absolute-absolute space $\hat{\hat{\Sigma}}$, containing the absolute-absolute rest masses $\hat{\hat{m}}_0$ and $\hat{\hat{M}}_0$ of different magnitudes, sizes and shapes, which are arbitrarily scattered in $\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\hat{\hat{\Sigma}}$, but which must be replaced by the universal isotropic 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$ containing the 'one-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of varying magnitudes and lengths of particles and bodies, which are not uniformly distributed along its length, as illustrated for a particle and a body in Fig. 3c of part one of this paper [2], effectively contains an absolutely 'massless dust particle' of absolute zero rest mass (occupying absolute zero length of 3-space $\Sigma$), at every point along the length of $\hat{\hat{\rho}}$ relative to the 3-observers in $\Sigma$.

As follows from the foregoing paragraph, the non-isotropic and non-homogeneous 'three-dimensional' universal absolute-absolute space $\hat{\hat{\Sigma}}$, containing 'three-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of varying magnitudes, shapes and sizes of particles and bodies, which are scattered arbitrarily in $\hat{\hat{\Sigma}}$, with respect to '3-observers' in $\hat{\hat{\Sigma}}$, like the inertial masses $m$, $M$ of the particles and bodies in the physical Euclidean 3-space $\Sigma$, with respect to 3-observers in $\Sigma$, is a perfectly isotropic and perfectly homogeneous 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$, containing a 'massless dust particle' of absolute zero rest mass and occupying absolute zero length of space at every point along its length, relative to 3-observers in universal relativistic Euclidean 3-space $\Sigma$.

On the other hand, while the 'three-dimensional' non-isotropic and non-homogeneous universal absolute space $\hat{\Sigma}$ with respect to '3-observers' in it, which contains 'three-dimensional' absolute rest masses $\hat{m}_0$, $\hat{M}_0$ of varying magnitudes, shapes and sizes of particles and bodies, which are scattered arbitrarily in $\hat{\Sigma}$ with respect to '3-observers' in $\hat{\Sigma}$, contracts to an isotropic 'one-dimensional' universal absolute space $\hat{\rho}$ with respect to 3-observers in $\Sigma$, as deduced in sub-section 4.7 of [1], it (the universal absolute space), is not a homogeneous space with respect to 3-observers in the universal relativistic Euclidean 3-space $\Sigma$, as explained in the following paragraph.

Now a non-zero absolute rest mass $\hat{m}_0$ is not absolute zero rest mass (or is not an absolutely massless or absolutely immaterial entity), but an absolute material entity with respect to 3-observers in $\Sigma$, as discussed in section 3 of [3]. The non-zero interval $\hat{r}_0$ of absolute space $\hat{\rho}$ occupied by $\hat{m}_0$ is likewise not absolute zero length of space with respect to 3-observers in $\Sigma$. On the other hand, an empty point in the absolute space $\hat{\rho}$ (containing zero absolute rest mass ($\hat{m}_0 = 0$)), is an absolutely massless point. It then follows that the universal isotropic 'one-dimensional' absolute space $\hat{\rho}$ contains 'one-dimensional' (absolute material) absolute rest masses $\hat{m}_0$, $\hat{M}_0$ of varying magnitudes and 'lengths' of particles and bodies along its length, which are separated by non-uniform (absolutely massless) empty intervals of $\hat{\rho}$ with respect to 3-observers in the physical relativistic Euclidean 3-space $\Sigma$. Consequently the absolute space is not homogeneous with respect to 3-observers in $\Sigma$. Of course the universal physical relativistic Euclidean 3-space $\Sigma$ with distinct directions and containing the inertial masses $m$, $M$ of different magnitudes, shapes and size of particles and bodies, which are scattered arbitrarily in it, is a non-isotropic and non-homogeneous 3-space (in the small) with respect to 3-observers in it.

The universal absolute-absolute intrinsic-intrinsic space is a 'three-dimensional' domain $\phi\phi\hat{\hat{\Sigma}}$ that contains 'three-dimensional' absolute-absolute intrinsic-intrinsic rest masses $\phi\phi\hat{\hat{m}}_0$, $\phi\phi\hat{\hat{M}}_0$ of varying magnitudes, shapes and sizes of particles and bodies, which are scattered arbitrarily in $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\phi\phi\hat{\hat{\Sigma}}$, exactly the way the inertial masses $m$, $M$ of the particles and bodies are scattered in the physical Euclidean 3-space $\Sigma$ with respect to 3-observers in $\Sigma$. The absolute-absolute intrinsic-intrinsic space is therefore non-isotropic and non-homogeneous with respect to '3-observers' in it. On the other hand, the universal absolute-absolute intrinsic-intrinsic space is a 'one-dimensional' isotropic absolute-absolute intrinsic-intrinsic space (or 'dimension') $\phi\phi\hat{\hat{\rho}}$ (with no unique orientation in $\Sigma$), with respect to 3-observers in $\Sigma$, as deduced in the preceding sub-section.

The isotropic 'one-dimensional' universal absolute-absolute space $\hat{\hat{\rho}}$ contains a 'massless dust particle' of absolute zero rest mass, occupying absolute zero length of space at every point of it with respect to 3-observers in the relativistic Euclidean 3-space $\Sigma$. It is consequently perfectly homogeneous with respect to 3-observers in $\Sigma$, as deduced earlier in this sub-section. Then since the isotropic 'one-dimensional' universal absolute-absolute space $\hat{\hat{\rho}}$ is the outward manifestation of the isotropic 'one-dimensional' universal absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$, with respect to 3-observers in $\Sigma$, $\phi\phi\hat{\hat{\rho}}$ likewise contains an absolutely 'massless intrinsic dust particle' of absolute zero intrinsic rest mass, occupying absolute zero length of intrinsic space at every point of it with respect to 3-observers in $\Sigma$. Consequently the 'three-dimensional' non-isotropic and non-homogeneous universal absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in it, is a perfectly isotropic and perfectly homogeneous 'one-dimensional' absolute-absolute intrinsic-intrinsic space (or 'dimension') $\phi\phi\hat{\hat{\rho}}$ with respect to 3-observers in the universal physical relativistic Euclidean 3-space $\Sigma$.

Let us consider the flat universal 'three-dimensional' absolute space $\hat{\Sigma}$ and its underlying straight line universal 'one-dimensional' absolute intrinsic space $\phi\hat{\rho}$ in Fig. 1 of [1]. That diagram is valid with respect to '3-observers' in the flat absolute space $\hat{\Sigma}$, with respect to whom the absolute intrinsic space is an isotropic 'one-dimensional' domain $\phi\hat{\rho}$ (with no unique orientation in $\hat{\Sigma}$).

Now let the flat 'three-dimensional' absolute space $\hat{\Sigma}$ and its underlying isotropic straight line 'one-dimensional' absolute intrinsic space $\phi\hat{\rho}$ with respect to '3-observers' in $\hat{\Sigma}$ in Fig. 1 of [1], be embedded in the universal physical Euclidean 3-space $\Sigma$. Then the flat 'three-dimensional' absolute space $\hat{\Sigma}$ with respect to '3-observers' in it, becomes an isotropic straight line 'one-dimensional' absolute space $\hat{\rho}$ (with no unique orientation in $\Sigma$), with respect to 3-observers in $\Sigma$, while the isotropic straight line 'one-dimensional' absolute intrinsic space $\phi\hat{\rho}$ underlying the flat $\hat{\Sigma}$ with respect to '3-observers' in $\hat{\Sigma}$, remains an isotropic straight line 'one-dimensional' absolute intrinsic space $\phi\hat{\rho}$ (with no unique orientation in $\Sigma$), with respect to 3-observers in $\Sigma$.

As deduced earlier in this sub-section, the straight line isotropic 'one-dimensional' universal absolute space $\hat{\rho}$ contains 'one-dimensional' (absolute material) absolute rest masses $\hat{m}_0$, $\hat{M}_0$ of varying magnitudes, occupying varying intervals $\hat{r}_0$, $\hat{R}_0$ of $\hat{\rho}$, of all particles and bodies, which are separated by absolutely massless empty intervals of $\hat{\rho}$, with respect to 3-observers in $\Sigma$. Consequently $\hat{\rho}$ is isotropic (that is, with no unique orientation in $\Sigma$), but is non-homogeneous, with respect to 3-observers in $\Sigma$.

Then since the straight line isotropic 'one-dimensional' universal absolute space $\hat{\rho}$ is the outward manifestation of the straight line isotropic 'one-dimensional' universal absolute intrinsic space $\phi\hat{\rho}$ with respect to 3-observers in $\Sigma$, the straight line 'one-dimensional' isotropic absolute intrinsic space $\phi\hat{\rho}$, likewise contains the absolute intrinsic rest masses $\phi\hat{m}_0$, $\phi\hat{M}_0$ of varying magnitudes, occupying varying intervals $\phi\hat{r}_0$, $\phi\hat{R}_0$ of $\phi\hat{\rho}$, of all particles and bodies, which are separated by empty intervals (containing zero absolute intrinsic rest mass), with respect to 3-observers in $\Sigma$. Consequently $\phi\hat{\rho}$ is isotropic (that is, with no unique orientation in $\Sigma$), but is non-homogeneous with respect to 3-observers in $\Sigma$.

Finally the universal one-dimensional isotropic relativistic intrinsic space $\phi\rho$ contains the intrinsic inertial masses $\phi m$, $\phi M$ of varying magnitudes, occupying varying lengths $\phi r$, $\phi R$ of $\phi\rho$, of all particles and bodies, which are separated by empty intervals (containing zero intrinsic inertial mass) of $\phi\rho$, with respect to 3-observers in $\Sigma$. Consequently $\phi\rho$ is isotropic (that is, with no unique orientation in $\Sigma$), but is non-homogeneous, with respect to 3-observers in $\Sigma$. This conclusion is equally valid for the universal proper intrinsic space $\phi\rho'$ containing the intrinsic rest masses $\phi m_0$, $\phi M_0$ of all particles and bodies.

Now the perfect isotropy of the 'three-dimensional' universal absolute-absolute space $\hat{\hat{\Sigma}}$ with respect to 3-observers in the relativistic Euclidean 3-space $\Sigma$, implies the spherical shape for $\hat{\hat{\Sigma}}$ and the absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of all particles and bodies in $\hat{\hat{\Sigma}}$, with respect to 3-observers in $\Sigma$. The universal spherical absolute-absolute space $\hat{\hat{\Sigma}}$ of radius $\hat{\hat{R}}$ containing the spherical absolute-absolute rest masses of a few particles and bodies (with respect to 3-observers in $\Sigma$) are illustrated in Fig. 1a.

However the universal spherical absolute-absolute space $\hat{\hat{\Sigma}}$ is actually perfectly homogeneously filled with a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point of it with respect to 3-observers in $\Sigma$, as derived earlier in this sub-section. Consequently the spherical universal absolute-absolute space $\hat{\hat{\Sigma}}$ of radius $\hat{\hat{R}}$ containing the spherical absolute-absolute rest masses of all particles and bodies (illustrated for a few particles and bodies in Fig. 1a), is actually a perfectly homogeneous spherical medium containing a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point of it, with respect to 3-observers in $\Sigma$, as illustrated in Fig. 1b. The perfectly homogeneous universal spherical absolute-absolute space $\hat{\hat{\Sigma}}$ has no unique center with respect to 3-observers in $\Sigma$, since everywhere is the same within it with respect to these observers, as shall be explained in the next sub-section.

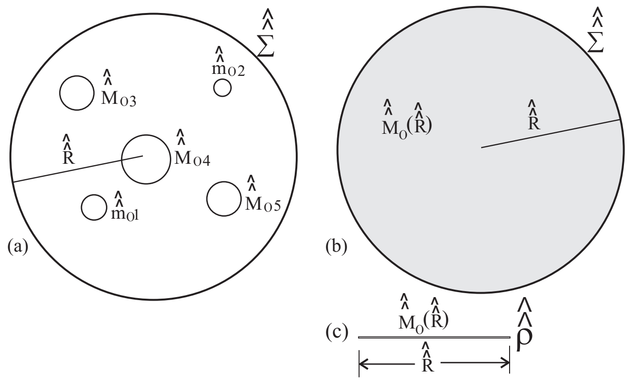


Figure 1: **a** The spherical universal absolute-absolute space with spherical absolute-absolute rest masses of some particles and objects scattered arbitrarily within it (with respect to '3-observers' in it, is equivalent to **b** in which the universal spherical absolute-absolute space contains a 'massless dust particle' of absolute zero rest mass and absolute zero extension in space with no unique center, with respect to 3-observers in the physical relativistic Euclidean 3-space. **c** However the universal absolute-absolute space is actually a 'one-dimensional' isotropic absolute-absolute space (or 'dimension') with no unique origin (or base), containing a 'massless dust particle' of absolute zero rest mass and absolute zero extension of space, with respect to 3-observers in the physical relativistic Euclidean 3-space.

Further more, the perfect isotropy (i.e. all directions are perfectly the same), of the universal spherical absolute-absolute space $\hat{\hat{\Sigma}}$ with respect to 3-observers in $\Sigma$, makes the 'three-dimensional' spherical form (or representation) of the absolute-

absolute space (in Fig. 1b) impossible with respect to 3-observers in $\Sigma$. Rather the perfectly homogeneous sphere $\hat{\hat{\Sigma}}$ of radius $\hat{\hat{R}}$, containing a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point of it, with no unique center with respect to 3-observers in $\Sigma$ in Fig. 1b, must be replaced by a 'one-dimensional' absolute-absolute space (or 'dimension') $\hat{\hat{\rho}}$ of 'length' $\hat{\hat{R}}$ with no unique base (or origin), containing a 'massless dust particle' of absolute zero rest mass and absolute zero extension of space at every point along its 'length', with respect to '3-observers' in $\Sigma$. This follows from the discussions of the perfect isotropy and perfect homogeneity of $\hat{\hat{\Sigma}}$ with respect to 3-observers in $\Sigma$ in the preceding sub-section and this sub-section. Consequently Fig. 1b must be replaced by the final Fig. 1c with respect to 3-observers in $\Sigma$.

The isotropic 'dimension' $\hat{\hat{\rho}}$ can be considered to be along any radial direction from the non-unique center of the sphere $\hat{\hat{\Sigma}}$ that contracts to it, with respect to 3-observers in $\Sigma$. Consequently $\hat{\hat{\rho}}$ can be considered to be orientated along any direction from a fictitious non-unique center of the universal relativistic Euclidean 3-space $\Sigma$ in which $\hat{\hat{\Sigma}}$ is embedded (but as the 'one-dimensional' $\hat{\hat{\rho}}$ in Fig. 3c or Fig. 4 of part one of this paper [2]), with respect to 3-observers in $\Sigma$. In other words, in whichever direction $\hat{\hat{\rho}}$ may lie in $\Sigma$, it must be considered to lie along a radial direction from a fictitious non-unique center of $\Sigma$ with respect to 3-observers in $\Sigma$.*

This sub-section shall be ended with a summary of the results namely, the straight line 'one-dimensional' universal absolute-absolute space $\hat{\hat{\rho}}$ and its underlying straight line 'one-dimensional' universal absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$, with respect to 3-observers in $\Sigma$ in Fig. 3c or Fig. 4 of part one of this paper [2], are both isotropic and homogeneous with respect to 3-observers in $\Sigma$; the curved 'one-dimensional' absolute intrinsic space $\phi\hat{\rho}$, the curved one-dimensional proper intrinsic space $\phi\rho'$ and the straight line relativistic intrinsic space $\phi\rho$ along the horizontal in Fig. 4 of [2], are isotropic but non-homogeneous intrinsic spaces with respect to 3-observers in $\Sigma$ and the relativistic Euclidean 3-space $\Sigma$ is non-isotropic and non-homogeneous with respect to 3-observers in it.

*It is referred to as fictitious non-unique center, because the universal physical Euclidean 3-space $\Sigma$ is spherical and has a unique center with respect to observers in it, as shall be determined with further development.

### *1.3 Everywhere the same and non-unique bases (or origins) of the 'one-dimensional' absolute-absolute space and 'one-dimensional' absolute-absolute intrinsic-intrinsic space with respect to 3-observers in the physical Euclidean 3-space*

The non-isotropic and non-homogeneous 'three-dimensional' universal absolute-absolute space $\hat{\hat{\Sigma}}$ with respect to '3-observers' in it, contains the 'three-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of varying magnitudes, shapes and sises of all particles and bodies, which are scattered arbitrarily in $\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\hat{\hat{\Sigma}}$. Any given two distinct points A and B in $\hat{\hat{\Sigma}}$ are separated by a non-zero interval $\Delta\hat{\hat{l}}$ of $\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\hat{\hat{\Sigma}}$. Hence pairs of non-coincident points are distinct within $\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\hat{\hat{\Sigma}}$. There is therefore a unique center of the 'three-dimensional' universal absolute-absolute space $\hat{\hat{\Sigma}}$ with spherical shape with respect to '3-observers' in it.

On the other hand, the perfectly isotropic and perfectly homogeneous 'one-dimensional' universal absolute-absolute space $\hat{\hat{\rho}}$ with respect to 3-observers in the physical Euclidean 3-space $\Sigma$, contains a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point of it with respect to 3-observers in $\Sigma$. Moreover an interval $\Delta\hat{\hat{\rho}}$ of $\hat{\hat{\rho}}$ separating two non-coincident points A and B along $\hat{\hat{\rho}}$, is equivalent to zero interval of absolute space ($\Delta\hat{\rho} = 0$), which is an absolute zero interval of 3-space $\Sigma$. This means that points along $\hat{\hat{\rho}}$ are not distinct (or are the same) or that everywhere is the same along $\hat{\hat{\rho}}$ relative to 3-observers in $\Sigma$. There is therefore no unique center of the spherical absolute-absolute space $\hat{\hat{\Sigma}}$, which corresponds to no unique base (or origin) of the 'one-dimensional' absolute-absolute space (or 'dimension') $\hat{\hat{\rho}}$ (in Fig. 3c of [2]), relative to 3-observers in $\Sigma$.

Likewise the non-isotropic and non-homogeneous 'three-dimensional' absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in it, contains the 'three-dimensional' absolute-absolute intrinsic-intrinsic rest masses $\phi\phi\hat{\hat{m}}_0$, $\phi\phi\hat{\hat{M}}_0$ of varying magnitudes, shapes and sizes of all particles and bodies, which are scattered arbitrarily in $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\phi\phi\hat{\hat{\Sigma}}$. Any given two distinct points A and B in $\phi\phi\hat{\hat{\Sigma}}$ are separated by a non-zero interval $\Delta\phi\phi\hat{\hat{l}}$ of $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in $\phi\phi\hat{\hat{\Sigma}}$. Hence pairs of non-coincident points are distinct within $\phi\phi\hat{\hat{\Sigma}}$ with respect to '3-observers' in it. There is therefore a unique center of the 'three-dimensional' universal absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$ with spherical shape with respect to '3-observers' in it.

On the other hand, the perfectly isotropic and perfectly homogeneous 'one-dimensional' universal absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$, with respect to 3-observers in the physical Euclidean 3-space $\Sigma$, contains a 'massless intrinsic dust particle' of absolute zero intrinsic rest mass and absolute zero intrinsic length at every point of it with respect to 3-observers in $\Sigma$. Moreover an interval $\Delta\phi\phi\hat{\hat{\rho}}$ of $\phi\phi\hat{\hat{\rho}}$ separating two non-coincident points A and B along $\phi\phi\hat{\hat{\rho}}$, is equivalent to zero interval of absolute intrinsic space ($\Delta\phi\hat{\rho} = 0$) and consequently it is equivalent to zero interval absolute space (or absolute zero interval of space). This means that points along $\phi\phi\hat{\hat{\rho}}$ are not distinct (or are the same), or that everywhere is the same along $\phi\phi\hat{\hat{\rho}}$ with respect to 3-observers in $\Sigma$. There is therefore no unique center of the spherical absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\Sigma}}$, which corresponds to no unique base (or origin) of the 'one-dimensional' absolute-absolute intrinsic-intrinsic space (or 'dimension') $\phi\phi\hat{\hat{\rho}}$ (in Fig. 3c of [2]), with respect to 3-observers in $\Sigma$.

### *1.4 Homogeneity and simultaneity of 'events' in absolute-absolute time and absolute-absolute intrinsic-intrinsic time relative to 3-observers in the physical Euclidean 3-space*

The universal absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ contains 'one-dimensional' absolute-absolute rest masses $\hat{\hat{\varepsilon}}/\hat{\hat{c}}^2$, $\hat{\hat{E}}/\hat{\hat{c}}^2$ of particles and bodies of varying magnitudes, occupying varying intervals $\hat{\hat{c}}\Delta\hat{\hat{t}}$ of $\hat{\hat{c}}\hat{\hat{t}}$, which are distributed non-uniformly along the 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$, with respect to '1-observers' in $\hat{\hat{c}}\hat{\hat{t}}$ and '3-observers' in the absolute-absolute space $\hat{\hat{\Sigma}}$. Hence the absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ is not a homogeneous 'dimension' with respect to '1-observers' in it and '3-observers' in $\hat{\hat{\Sigma}}$.

Now any magnitude of absolute-absolute rest mass $\hat{\hat{\varepsilon}}/\hat{\hat{c}}^2$ is equivalent to zero magnitude of absolute rest mass ($\hat{\varepsilon}/\hat{c}^2 = 0$) and any interval $\hat{\hat{c}}\Delta\hat{\hat{t}}$ of the absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ occupied by $\hat{\hat{\varepsilon}}/\hat{\hat{c}}^2$ is equivalent to zero interval of absolute time 'dimension' ($\hat{c}\Delta\hat{t} = 0$). Consequently every point along the absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ contains a 'massless dust particle' of absolute zero rest mass that occupies absolute zero interval of time dimension with respect to 1-observers in the time dimension $ct$ and 3-observers in the relativistic Euclidean 3-space $\Sigma$. In other words, the absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ is a perfectly homogeneous 'dimension' relative to 1-observers in $ct$ and 3-observers in $\Sigma$.

As follows from the foregoing paragraph, the condition of any given point is the same as that of every other point along $\hat{\hat{c}}\hat{\hat{t}}$, with respect to 1-observers in $ct$ and 3-observers in $\Sigma$. Moreover the interval $\hat{\hat{c}}\Delta\hat{\hat{t}}$ of the absolute-absolute time 'dimension' separating a pair of non-coincident points $A^0$ and $B^0$ along $\hat{\hat{c}}\hat{\hat{t}}$ , with respect to '1-observers' in $\hat{\hat{c}}\hat{\hat{t}}$ and '3-observers' in $\hat{\hat{\Sigma}}$, is equivalent to zero interval of absolute time 'dimension' ($\hat{c}\Delta\hat{t} = 0$). Hence every pair of points along $\hat{\hat{c}}\hat{\hat{t}}$ are separated by absolute zero interval of time dimension with respect to 1-observers in $ct$ and 3-

observers in $\Sigma$, which is the same as saying that all points along $\hat{\hat{c}}\hat{\hat{t}}$ are the same relative to 1-observers in $ct$ and 3-observers in $\Sigma$.

It follows from the foregoing paragraph that two absolute-absolute events that occur at two distinct points along the absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ with respect to '1-observers' in $\hat{\hat{c}}\hat{\hat{t}}$ and '3-observers' in $\hat{\hat{\Sigma}}$, occur at the same point along $\hat{\hat{c}}\hat{\hat{t}}$ relative to 1-observers in physical time dimension $ct$ and 3-observers in the physical Euclidean 3-space $\Sigma$. In other words, absolute-absolute events occur simultaneously in the absolute-absolute time $\hat{\hat{t}}$ relative to 1-observers in $ct$ and 3-observers in $\Sigma$. This is the concept of simultaneity of absolute-absolute events in the absolute-absolute time relative to 1-observers in the physical time dimension $ct$ and 3-observers in the physical Euclidean 3-space $\Sigma$, which corresponds to 'everywhere is the same' in the absolute-absolute space $\hat{\hat{\rho}}$ relative to 3-observers in $\Sigma$.

A similar argument for the absolute-absolute intrinsic-intrinsic time 'dimension' $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ as done for the absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ above, which shall be avoided in order to conserve space, leads to the conclusion that a pair of absolute-absolute intrinsic-intrinsic events that occur at two distinct points along the 'dimension' $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$, with respect to '1-observers' in $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ and '3-observers' in $\phi\phi\hat{\hat{\Sigma}}$, occur at the same point in time relative to 1-observers in $ct$ and 3-observers in $\Sigma$. In other words, absolute-absolute intrinsic-intrinsic events occur simultaneously in absolute-absolute intrinsic-intrinsic time $\phi\phi\hat{\hat{t}}$ relative to 1-observers in the physical time dimension and 3-observers in the physical Euclidean 3-space. This, again, is the concept pf simultaneity of absolute-absolute intrinsic-intrinsic events in absolute-absolute intrinsic-intrinsic time relative to 1-observers in the physical time dimension and 3-observers in the physical Euclidean 3-space, which corresponds to 'everywhere is the same' in absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$ relative to 3-observers in $\Sigma$.

### *1.5 The universal synchronous time coordinate and universal synchronous time parameter*

The absolute-absolute time coordinates $\hat{\hat{c}}\hat{\hat{t}}_1$, $\hat{\hat{c}}\hat{\hat{t}}_2$, $\hat{\hat{c}}\hat{\hat{t}}_3$, etc, of the absolute-absolute spacetime coordinate systems $(\hat{\hat{r}}_1, \hat{\hat{c}}\hat{\hat{t}}_1)$, $(\hat{\hat{r}}_2, \hat{\hat{c}}\hat{\hat{t}}_2)$, $(\hat{\hat{r}}_3, \hat{\hat{c}}\hat{\hat{t}}_3)$, etc, attached to the 'one-dimensional' absolute-absolute rest masses $\hat{\hat{M}}_{01}$, $\hat{\hat{M}}_{02}$, $\hat{\hat{M}}_{03}$, etc, in $\hat{\hat{\rho}}$, of all gravitational field sources in the universe, as well as $\hat{\hat{c}}\hat{\hat{t}}$ of the frame $(\hat{\hat{r}}, \hat{\hat{c}}\hat{\hat{t}})$ that originates from an empty point containing zero absolute-absolute rest mass ($\hat{\hat{M}}_0 = 0$) in $\hat{\hat{\rho}}$, are the same, as expressed by the equivalence of all absolute-absolute spacetime frames (22) of part one of this paper [2].

As follows from the foregoing paragraph, initially synchronous identical absolute-absolute clocks kept in the absolute-absolute space $\hat{\hat{\rho}}$ at different positions in a gravitational field, will tick at the same rate and remain synchronous always relative to 3-observers in $\Sigma$. It then follows that initially synchronous identical absolute-absolute clocks kept in the absolute-absolute space at different locations in spacetime within the entire universe, will tick at equal rate and remain synchronous always relative to 3-observers in $\Sigma$. Likewise initially synchronous identical absolute-absolute intrinsic-intrinsic clocks in absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$, at different positions in a gravitational field, will tick at the same rate and remain synchronous always relative 3-observers in $\Sigma$. It again follows that initially synchronous identical absolute-absolute intrinsic-intrinsic clocks kept in the absolute-absolute intrinsic-intrinsic space $\phi\phi\hat{\hat{\rho}}$ at different locations in spacetime within the entire universe, will tick at equal rate and remain synchronous always relative to 3-observers in $\Sigma$.

The straight line universal absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ along the vertical, co-exists with the straight line universal relativistic time dimension $ct$ along the vertical in Fig. 3c or Fig. 4 of part one of this paper [2]. The $\hat{\hat{c}}\hat{\hat{t}}$ serves the role of the absolute (or synchronous) time coordinate at every point in spacetime in the universe. Thus $\hat{\hat{t}}$ is the Newtonian universal absolute time parameters (or the universal synchronous time), which appears in the Newtonian mechanics, where Newtonian mechanics has been identified as the Newtonian theory of absolute-absolute gravity (NAAG) and Newtonian theory of absolute-absolute motion (NAAM) on flat absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ — the Newtonian absolute spacetime — in sub-section 3.1 of part one of this paper [2].

The straight line absolute-absolute intrinsic-intrinsic time 'dimension' $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ serves the role of Newtonian absolute intrinsic time coordinate (or the synchronous intrinsic time coordinate) at every point in spacetime in the universe. Thus $\phi\phi\hat{\hat{t}}$ is the Newtonian universal absolute intrinsic time parameter (or universal synchronous intrinsic time) that appears in intrinsic Newtonian mechanics, where intrinsic Newtonian mechanics has been identified as the Newtonian theory of absolute-absolute intrinsic-intrinsic gravity ($\phi\phi$NAAG) and Newtonian theory of absolute-absolute intrinsic-intrinsic motion ($\phi\phi$NAAM) on flat absolute-absolute intrinsic-intrinsic spacetime $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ — the Newtonian absolute intrinsic spacetime — in sub-section 3.1 of part one of this paper [2].

On the other hand, an interval $\phi c d\phi t'$ of the curved proper intrinsic time dimension $\phi c\phi t'$ projects interval $\phi c d\phi t$ of relativistic intrinsic time dimension into the relativistic intrinsic time dimension $\phi c\phi t$ along the vertical in Fig. 4 of [2], where $\phi c d\phi t$ is related to $\phi c d\phi t'$ with respect to 3-observers in the relativistic Euclidean 3-space $\Sigma$ as follows

$$\phi c d\phi t = \phi c d\phi t' \sec\phi\psi_g(\phi r') = (1 - \frac{2G\phi M_{0\mathrm{a}}}{\phi r'\phi c_g^2})^{-1/2}\,\phi c d\phi t' \qquad (1)$$

where $\phi\psi_g(\phi r')$ is the intrinsic angle of inclination of the curved $\phi c\phi t'$ relative to its projective straight line $\phi c\phi t$ along the vertical at 'distance' $\phi r'$ along the curved $\phi c\phi t'$ from the base of the intrinsic rest mass $\phi E'/\phi c^2$ of the gravitational field source at the origin of the curved $\phi c\phi t'$ in Fig. 4 of [2] or Fig. 1 of [4].

The outward manifestation in spacetime of Eq. (1) in intrinsic spacetime is the following

$$cdt = cdt' \sec\psi_g(r') = cdt'(1 - \frac{2GM_{0\mathrm{a}}}{r'c_g^2})^{-1/2}\, cdt' \tag{2}$$

Equation (1) is intrinsic gravitational time dilation in the context of intrinsic theory of gravitational relativity ($\phi$TGR) and Eq. (2) is gravitational time dilation formula in the context of the theory of gravitational relativity (TGR), derived formally in [5].

Now the proper intrinsic time interval $d\phi t'$ involved in a proper intrinsic event on curved proper intrinsic spacetime $(\phi\rho', \phi c\phi t')$ (in Fig. 3 of [1]), and the corresponding proper intrinsic interval $dt'$ involved in a proper event within local Lorentz frames on the elusive curved proper spacetime $(\Sigma', ct')$, like every other proper intrinsic parameters, $\phi m_0$, $\phi\Phi'(\phi r')$, $\phi g'(\phi r')$, $\phi F'$, etc, and every proper parameter $m_0$, $\Phi'(r')$, $g'(r')$, $F'$, etc, that evolve in the context of absolute intrinsic gravity and absolute gravity ($\phi$AG/AG), at the first stage of evolutions of spacetime/intrinsic spacetime and parameters/intrinsic parameters in a gravitational field, have constant magnitudes with position in a gravitational field, as expressed by the trivial transformations of spacetime coordinates/intrinsic spacetime coordinates and parameters/intrinsic parameters in the context of the theory of absolute intrinsic gravity ($\phi$AG) and theory of absolute gravity (AG) in systems (135) and (136) of [1], which are valid at every point in spacetime in a gravitational field and consequently at every point in spacetime in the universe.

The foregoing paragraph says that $d\phi t'$ and $dt'$ must be taken as constants at different points in spacetime in every gravitational field and within the entire universe. On the other hand, the intrinsic angle $\phi\psi_g(\phi r')$ or the factor $(1 - 2G\phi M_{0\mathrm{a}}/\phi r'\phi c_g^2)$ in Eq. (1) and the angle $\psi_g(r')$ or the factor $(1 - 2GM_{0\mathrm{a}}/r'c_g^2)$ in Eq. (2), vary with position in a gravitational field. Therefore the relativistic intrinsic time interval $d\phi t$ involved in an intrinsic event on flat relativistic intrinsic spacetime $(\phi\rho, \phi c\phi t)$ and the corresponding relativistic time interval $dt$ involved in the event on flat relativistic spacetime $(\Sigma, ct)$, vary with position in spacetime in a gravitational field, according to Eqs. (1) and (2). Consequently they vary with position in spacetime within the universe.

It follows from the foregoing paragraph that initially synchronous identical intrinsic clocks kept in the relativistic intrinsic space $\phi\rho$ at different positions in a gravitational field or at different positions in the universe, will tick at different rates and will not remain synchronous with the passage of relativistic intrinsic time $\phi t$.

Likewise initially synchronous identical clocks kept in the relativistic Euclidean 3-space $\Sigma$ at different positions in a gravitational field or at different positions in the universe, will tick at different rates and will not remain synchronous with the passage of the relativistic time $t$. Consequently the universal relativistic intrinsic time dimension $\phi c \phi t$ and the universal relativistic time dimension $ct$ in Fig. 3c or Fig. 4 of part one of this paper [2], are not synchronous intrinsic time dimension and not synchronous time dimension.

### *1.6 Co-moving coordinate systems (or frames) and co-moving coordinates*

The conditions of all points along the perfectly homogeneous isotropic 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$, being perfectly the same and perfectly the same as the conditions of all the symmetry-partner points along the perfectly homogeneous absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$, relative to 3-observers in the relativistic Euclidean 3-space $\Sigma$, as deduced in sub-sections 1.3 and 1.4 above, every absolute-absolute speed, such as absolute-absolute gravitational speed $\hat{\hat{V}}_g$, absolute-absolute dynamical speed $\hat{\hat{V}}_d$ and any other kind of absolute-absolute speed, which may be established along $\hat{\hat{\rho}}$ and $\hat{\hat{c}}\hat{\hat{t}}$, has the same magnitude at every point along $\hat{\hat{\rho}}$ and at every point along $\hat{\hat{c}}\hat{\hat{t}}$, with respect to 3-observers in $\Sigma$. Thus all points along $\hat{\hat{\rho}}$ and $\hat{\hat{c}}\hat{\hat{t}}$ must be said to be 'moving' at equal speed that may be established along these 'dimensions' with respect to 3-observers in $\Sigma$. In other words, points along the 'dimensions' $\hat{\hat{\rho}}$ and $\hat{\hat{c}}\hat{\hat{t}}$ are 'co-moving' points with respect to 3-observers in $\Sigma$.

It follows from the end of the foregoing paragraph that the identical (distinguished) coordinate set (or frame) $(\hat{\hat{r}}, \hat{\hat{c}}\hat{\hat{t}})$ that originates from every point of the 'two-dimensional' absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ , with which NAAG must be formulated for all gravitational field sources, as deduced in section 3 of part one of this paper [2], (expressed by the equivalence of all coordinate sets (22) of that paper), is a co-moving coordinate set (or frame) with respect to 3-observers in $\Sigma$. Hence the identical coordinates $\hat{\hat{r}}$ and $\hat{\hat{c}}\hat{\hat{t}}$ of every point in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$, are co-moving coordinates with respect to 3-observers in $\Sigma$. We shall sometimes sloppily refer to the 'dimensions' $\hat{\hat{\rho}}$ and $\hat{\hat{c}}\hat{\hat{t}}$ as co-moving 'dimensions' with respect to 3-observers in $\Sigma$ as well.

By repeating the discussion for $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ above by $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$, or by noting that $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ is outward manifestation of $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$, hence the distinguished coordinate set $(\hat{\hat{r}}, \hat{\hat{c}}\hat{\hat{t}})$ that originates from every point of $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ is the outward manifestation of the distinguished intrinsic coordinate set $(\phi\phi\hat{\hat{r}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ that originates from every point of $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ (with which $\phi\phi$NAAG must be formulated for every gravitational field source with respect to 3-observers in $\Sigma$), then $(\phi\phi\hat{\hat{r}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ is a co-moving intrinsic coordinate set (or frame). Hence the absolute-absolute intrinsic-

intrinsic coordinates $\phi\phi\hat{\hat{r}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ of every point of $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ are co-moving intrinsic coordinates with respect to 3-observers in $\Sigma$. We shall sometimes sloppily refer to the absolute-absolute intrinsic-intrinsic 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{c}\phi\phi\hat{\hat{t}}$ as co-moving intrinsic 'dimensions' with respect to 3-observers in $\Sigma$ as well.

Now any magnitude of absolute-absolute intrinsic-intrinsic gravitational speed $\phi\phi\hat{\hat{V}}_g$ in the range $0 \leq \phi\phi\hat{\hat{V}}_g \leq \infty$, which may be established at every point along the 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$, leaves the flatness of $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ in Fig. 3c or Fig. 4 of part one of this paper [2] unchanged. That is, it does not lead to rotation (or skewing) of the 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ (or of the co-moving intrinsic coordinates $\phi\phi\hat{r}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ of every point of these intrinsic 'dimensions') relative to 3-observers in $\Sigma$. This is so because any magnitude of $\phi\phi\hat{\hat{V}}_g$ in $0 \leq \phi\phi\hat{\hat{V}}_g \leq \infty$ is equivalent to zero absolute intrinsic gravitational speed ($\phi\hat{V}_g = 0$), which implies absolute absence of gravity with respect to 3-observers in $\Sigma$. In this fact lies the infinite range of absolute-absolute gravitational speeds $0 \leq \hat{\hat{V}}_g \leq \infty$ in the context of NAAG.

We shall come across other absolute-absolute intrinsic-intrinsic speeds, apart from $\phi\phi\hat{\hat{V}}_g$ and $\phi\phi\hat{\hat{V}}_d$, upon propagating the present theory to black hole physics and cosmological model, which shall be denoted simply by $\phi\phi\hat{\hat{V}}_0$ here, but shall be appropriately denoted and named in black hole physics and cosmological model, such that non-zero magnitude of $\phi\phi\hat{\hat{V}}_0$ established at every point along $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$, gives rise to anti-clockwise rotation of the 'dimension' $\phi\phi\hat{\hat{\rho}}$ by non-zero absolute-absolute intrinsic-intrinsic angle $\phi\phi\hat{\hat{\psi}}_0$ relative to the horizontal with respect to 3-observers in $\Sigma$, where $\sin\phi\phi\hat{\hat{\psi}}_0 = \phi\phi\hat{\hat{V}}_0/\phi\phi\hat{\hat{c}}$, and clockwise rotation of the 'dimension' $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ by equal 'angle' $\phi\phi\hat{\hat{\psi}}_0$ relative to the vertical, with respect to 1-observers in $ct$. This implies that the co-moving coordinates $\phi\phi\hat{\hat{r}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ at every point along the 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ respectively, are rotated anti-clockwise relative to the horizontal and clockwise relative to the vertical respectively, by equal absolute-absolute intrinsic-intrinsic angle $\phi\phi\hat{\hat{\psi}}_0$, with respect to 3-observers in $\Sigma$ and 1-observers in $ct$ respectively. The resultant effect is that $\phi\phi\hat{\hat{\rho}}$ is uniformly inclined to the horizontal by 'angle' $\phi\phi\hat{\hat{\psi}}_0$ (as illustrated in Fig. 7 of [3]), and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ is uniformly inclined to the vertical at equal 'angle' $\phi\phi\hat{\hat{\psi}}_0$, with respect to 3-observers in $\Sigma$ and 1-observers in $ct$ respectively.

As a rule, the straight line intrinsic 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ (with co-moving intrinsic coordinates $\phi\phi\hat{\hat{r}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ at every point of them) in a gravitational field in Fig. 3c or Fig. 4 of [2], can only be transformed into inclined straight line 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ by an absolute-absolute intrinsic-intrinsic speed

$\phi\phi\hat{\hat{V}}_0$ (not $\phi\phi\hat{\hat{V}}_g$ or $\phi\phi\hat{\hat{V}}_d$), which has equal magnitude at every point of $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$. The co-moving 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ cannot be non-uniformly curved. Further discussions of the 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ as co-moving 'dimensions', shall be deferred until the present theory propagates to black hole physics and cosmological model.

On the other hand, the absolute intrinsic space $\phi\hat{\rho}$ and absolute intrinsic time 'dimension' $\phi\hat{c}\phi\hat{t}$ are inhomogeneous 'dimensions', as deduced in sub-section 1.2. Absolute intrinsic rest masses $\phi\hat{m}_0$, $\phi\hat{M}_0$ of different magnitudes and different 'lengths' are non-uniformly distributed along the 'dimension' $\phi\hat{\rho}$, which are separated by empty intervals (i.e containing zero absolute intrinsic rest mass) of $\phi\hat{\rho}$. Absolute intrinsic rest masses $\phi\hat{\varepsilon}/\phi\hat{c}^2$, $\phi\hat{E}/\phi\hat{c}^2$ of the symmetry-partner particles and bodies of different magnitudes and different 'lengths', are likewise non-uniformly distributed along the 'dimension' $\phi\hat{c}\phi\hat{t}$, which are separated by empty intervals of the 'dimension' $\phi\hat{c}\phi\hat{t}$.

The absolute intrinsic rest mass $(\phi\hat{M}_0, \phi\hat{E}/\phi\hat{c}^2)$ of a gravitational field source located at a point in the 'two-dimensional' absolute intrinsic spacetime $(\phi\hat{\rho}, \phi\hat{c}\phi\hat{t})$, establishes non-uniform absolute intrinsic gravitational speeds $\phi\hat{V}_g(\phi\hat{r})$ along the 'dimensions' $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$ from its location. Hence absolute intrinsic gravitational speed $\phi\hat{V}_g(\phi\hat{r})$ has different magnitudes at different points along the 'dimensions' $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$ within gravitational fields and within the universe, with respect to 3-observers in $\Sigma$.

It follows from the foregoing paragraph that different points at 'distances' $\phi\hat{r}_1$, $\phi\hat{r}_2$, $\phi\hat{r}_3$, etc, along $\phi\hat{\rho}$ from the base of $\phi\hat{M}_0$ in $\phi\hat{\rho}$ and along $\phi\hat{c}\phi\hat{t}$ from the base of $\phi\hat{E}/\phi\hat{c}^2$ in $\phi\hat{c}\phi\hat{t}$, possess different 'speeds' $\phi\hat{V}_g(\phi\hat{r}_1)$, $\phi\hat{V}_g(\phi\hat{r}_2)$, , $\phi\hat{V}_g(\phi\hat{r}_3)$, etc, with respect to 3-observers in $\Sigma$. Consequently we should say that different points on $(\phi\hat{\rho}, \phi\hat{c}\phi\hat{t})$ are not co-moving (or are not co-moving points) with respect to 3-observers in $\Sigma$. It then follows that the different coordinate sets (or frames) $(\phi\hat{r}', \phi\hat{c}\phi\hat{t}')$, $(\phi\hat{r}'', \phi\hat{c}\phi\hat{t}'')$, $(\phi\hat{r}''', \phi\hat{c}\phi\hat{t}''')$, etc, attached to distances $\phi\hat{r}_1$, $\phi\hat{r}_2$, $\phi\hat{r}_3$, etc, along $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$, from the base of $(\phi\hat{M}_0, \phi\hat{E}/\phi\hat{c}^2)$ in the curved $(\phi\hat{\rho}, \phi\hat{c}\phi\hat{t})$, are not co-moving coordinate sets (or frames) with respect to 3-observers in $\Sigma$. The absolute intrinsic spacetime 'dimensions' $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$ are therefore not co-moving 'dimensions' with respect to 3-observers in $\Sigma$.

The non-uniform absolute intrinsic gravitational speeds $\phi\hat{V}_g(\phi\hat{r})$ along the not co-moving 'dimensions' $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$ in a gravitational field, cause $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$ to be non-uniformly curved in a gravitational field, as in Fig. 4 of part one of this paper [2]. The non-uniform proper intrinsic gravitational speeds $\phi V_g'(\phi r')$ along the non-co-moving proper intrinsic spacetime dimensions $\phi\rho'$ and $\phi c\phi t'$, likewise cause non-uniform curvatures of $\phi\rho'$ and $\phi ct'$ in a gravitational field, as also shown in Fig. 4 of [2].

On the other hand, the presence of non-uniform proper intrinsic gravitational speeds $\phi V_g'(\phi r')$ along the non-co-moving relativistic intrinsic spacetime dimensions $\phi\rho$ and $\phi c\phi t$, which the non-uniform proper intrinsic speeds $\phi V_g'(\phi r')$ along the curved $\phi\rho'$ and $\phi c\phi t'$ invariantly project along $\phi\rho$ along the horizontal and along $\phi c\phi t$ along the vertical, cannot cause the curvatures of $\phi\rho$ and $\phi c\phi t$. Only non-uniform relativistic intrinsic gravitational speeds $\phi V_g(\phi r) = -(2G\phi M_{\text{a}}/\phi r)^{1/2}$ along $\phi\rho$ and $\phi c\phi t$ can cause the curvature of these relativistic intrinsic dimensions. However relativistic intrinsic gravitational speed $\phi V_g(\phi r)$ does not exist, since the intrinsic inertial mass $(\phi M, \phi E/\phi c^2)$ in $(\phi\rho, \phi c\phi t)$ is not a source of intrinsic gravitational field (or speed). This fact prevents the evolutions of spacetime/intrinsic spacetime and parameters/intrinsic parameters from going beyond the second stage, as explained in sub-section 3.1 of [6].

In summary, we have identified the absolute-absolute intrinsic-intrinsic spacetime 'dimensions' $\phi\phi\hat{\hat{\rho}}$ and $\phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}}$ as perfectly homogeneous, perfectly isotropic co-moving intrinsic 'dimensions' with respect to 3-observers in $\Sigma$. This means that the distinguished coordinate set (or frame) $(\phi\phi\hat{\hat{r}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ that originates from every point of $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ with respect to 3-observers in $\Sigma$, is a co-moving coordinate set (or frame) with respect to these observers. The absolute-absolute spacetime 'dimensions' $\hat{\hat{\rho}}$ and $\hat{\hat{c}}\hat{\hat{t}}$ are likewise perfectly homogeneous, perfectly isotropic co-moving 'dimensions' with respect to 3-observers in $\Sigma$. This means that the distinguished coordinate set (or frame) $(\hat{\hat{r}}, \hat{\hat{c}}\hat{\hat{t}})$ that originates from every point of $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ with respect to 3-observers in $\Sigma$, is a co-moving coordinate set (or frame) with respect to these observers.

On the other hand, the absolute intrinsic spacetime 'dimensions' $\phi\hat{\rho}$ and $\phi\hat{c}\phi\hat{t}$ are isotropic, non-homogeneous, non-co-moving intrinsic 'dimensions' with respect to 3-observers in $\Sigma$. This means that the distinct local coordinate sets (or frames) $(\phi\hat{r}', \phi\hat{c}\phi\hat{t}')$, $(\phi\hat{r}'', \phi\hat{c}\phi\hat{t}'')$, $(\phi\hat{r}''', \phi\hat{c}\phi\hat{t}''')$, etc, of different points on $(\phi\hat{\rho}, \phi\hat{c}\phi\hat{t})$, are not co-moving coordinates with respect to 3-observers in $\Sigma$. The proper intrinsic spacetime dimensions $\phi\rho'$ and $\phi c\phi t'$, as well as the relativistic intrinsic spacetime dimensions $\phi\rho$ and $\phi c\phi t$ are likewise isotropic, non-homogeneous, non-co-moving intrinsic dimensions with respect to 3-observers in $\Sigma$.

The relativistic Euclidean 3-space $\Sigma$ is a non-isotropic 3-space with respect to 3-observers in it, and the four-dimensional relativistic spacetime $(\Sigma, ct)$ is a non-homogeneous, non-co-moving spacetime. This means that the conditions of different points in $(\Sigma, ct)$ are non-identical and different coordinates $(x^{0\prime}, x^{1\prime}, x^{2\prime}, x^{3\prime})$, $(x^{0\prime\prime}, x^{1\prime\prime}, x^{2\prime\prime}, x^{3\prime\prime})$, $(x^{0\prime\prime\prime}, x^{1\prime\prime\prime}, x^{2\prime\prime\prime}, x^{3\prime\prime\prime})$, etc, of different points in $(\Sigma, ct)$ are non-identical, non-co-moving coordinates, with respect to 3-observers in $\Sigma$.

## 2 The impossibility (or non-existence) of NAAG, NAAM and other absolute-absolute natural laws of physics on flat absolute-absolute spacetime with respect to observers in spacetime

The flat 'two-dimensional' absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ — the Newtonian absolute spacetime — which is embedded in the flat four-dimensional relativistic spacetime $(\Sigma, ct)$, as illustrated in Fig. 3c or Fig. 4 of part one of this paper [2], is absolutely non-observable and absolutely non-detectable to 3-observers in $\Sigma$. The Newtonian theory of absolute-absolute gravity (NAAG) and Newtonian theory of absolute-absolute motion (NAAM) in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$, (that is, Newtonian mechanics in the Newtonian absolute spacetime) are likewise absolutely non-observable and absolutely non-detectable to 3-observers in $\Sigma$. This is so because any magnitude of absolute-absolute gravitational speed $\hat{\hat{V}}_g(\hat{\hat{r}})$ in $\hat{\hat{\rho}}$ is equivalent to zero magnitude of absolute gravitational speed $(\hat{V}_g(\hat{r}) = 0)$, any magnitude of absolute-absolute gravitational potential $\hat{\hat{\Phi}}(\hat{\hat{r}})$ is equivalent to zero magnitude of absolute gravitational potential $(\hat{\Phi}(\hat{r}) = 0)$ and any magnitude of absolute-absolute gravitational acceleration $\hat{\hat{g}}(\hat{\hat{r}})$ in $\hat{\hat{\rho}}$ is equivalent to zero magnitude of absolute gravitational acceleration $(\hat{g}(\hat{r}) = 0)$. In other words, any magnitude of absolute-absolute gravitational speed $\hat{\hat{V}}_g(\hat{\hat{r}})$ in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ in the context of NAAG, is equivalent to absolute zero gravitational speed in spacetime $(\Sigma, ct)$ or with respect to 3-observers in $\Sigma$; any magnitude of $\hat{\hat{\Phi}}(\hat{\hat{r}})$ in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ is equivalent to absolute zero gravitational potential in spacetime $(\Sigma, ct)$ (or with respect to 3-observers in $(\Sigma, ct)$) and any magnitude of $\hat{\hat{g}}(\hat{\hat{r}})$ in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ is equivalent to absolute zero gravitational acceleration in spacetime $(\Sigma, ct)$ (or with respect to 3-observers in $\Sigma$).

It follows from the foregoing that the essential equations of NAAG with respect to 3-observers in $\Sigma$, presented as Eqs. (1) – (5) of part one of this paper [2], are the same as the following

$$\hat{\hat{\Phi}}(\hat{\hat{r}}) = -\frac{1}{2}\hat{\hat{V}}_g(\hat{\hat{r}})^2 \equiv 0 \times \hat{\Phi}(\hat{r}) = 0 \tag{3}$$

$$\hat{\hat{g}}(\hat{\hat{r}}) = \frac{1}{2}\frac{d}{d\hat{\hat{r}}}(\hat{\hat{V}}_g(\hat{\hat{r}})^2) \equiv 0 \times \hat{g}(\hat{r} = 0 \tag{4}$$

$$\hat{\hat{U}}(\hat{\hat{r}}) = \hat{\hat{m}}_0\hat{\hat{\Phi}}(\hat{\hat{r}}) \equiv 0 \times \hat{U}(\hat{r}) = 0 \tag{5}$$

$$\hat{\hat{F}}_g(\hat{\hat{r}}) = \hat{\hat{m}}_0\hat{\hat{g}}(\hat{\hat{r}}) \equiv 0 \times \hat{F}_g(\hat{r}) = 0 \text{ and} \tag{6}$$

$$\frac{d^2\hat{\hat{r}}}{d\hat{\hat{t}}^2} = \hat{\hat{g}}(\hat{\hat{r}}) \equiv 0 \times \hat{g} = 0 \tag{7}$$

Equations (3) – (7) say that not only is NAAG non-observable and non-detectable to 3-observers in $\Sigma$, but that it does not exist as a theory of gravity with respect to these observers. Equations (3) and (4) say that absolute-absolute rest mass $\hat{\hat{M}}_0$ of any magnitude is a source of zero absolute gravitational field and zero absolute gravitational potential, and is hence absolutely not a gravitational field source with respect to 3-observers in $\Sigma$.

The Newtonian theory of absolute-absolute motion (NAAM) in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ is likewise non-observable and non-detectable to 3-observers in $\Sigma$, because any magnitude of absolute-absolute dynamical speed $\hat{\hat{V}}_d$ in $\hat{\hat{\rho}}$ is equivalent to zero absolute dynamical speed ($\hat{V}_d = 0$) and any magnitude of absolute-absolute inertial acceleration $\hat{\hat{a}}$ in $\hat{\hat{\rho}}$ is equivalent to zero absolute inertial acceleration ($\hat{a} = 0$). In other words, any magnitude of $\hat{\hat{V}}_d$ in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ in the context of NAAM is equivalent to absolute zero dynamical speed in spacetime $(\Sigma, ct)$ or with respect to 3-observers in $\Sigma$, and any magnitude of $\hat{\hat{a}}$ in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ in the context of NAAM is equivalent to absolute zero inertial acceleration in $(\Sigma, ct)$ or with respect to 3-observers in $\Sigma$.

It follows from the foregoing paragraph that the essential equations of NAAM with respect to 3-observers in $\Sigma$, presented as Eqs. (11) – (14) of part one of this paper [2], are the same as the following

$$\hat{\hat{p}} = \hat{\hat{m}}_0\hat{\hat{V}}_d \equiv 0 \times \hat{m}_0\hat{V}_d = 0 \times \hat{p} = 0 \tag{8}$$

$$\hat{\hat{E}}_{\text{kin}} = \frac{1}{2}\hat{\hat{m}}_0\hat{\hat{V}}_d^2 = 0 \times \frac{1}{2}\hat{m}_0\hat{V}_d^2 = 0 \times \hat{E}_{\text{kin}} = 0 \tag{9}$$

$$\frac{d^2\hat{\hat{x}}}{d\hat{\hat{t}}^2} = \hat{\hat{a}} \equiv 0 \times \hat{a} = 0 \text{ and} \tag{10}$$

$$\hat{\hat{F}} = \hat{\hat{m}}_0\hat{\hat{a}} \equiv 0 \times \hat{m}_0\hat{a} = 0 \times \hat{F} = 0 \tag{11}$$

We find from Eqs. (8) – (11) that the absolute-absolute rest mass $\hat{\hat{m}}_0$ of a particle or object that possesses any magnitude of absolute-absolute dynamical speed $\hat{\hat{V}}_d$ and any magnitude of absolute-absolute inertial acceleration $\hat{\hat{a}}$ in $\hat{\hat{\rho}}$, possesses absolute zero momentum, absolute zero kinetic energy and absolute zero inertial acceleration, with respect to 3-observers in $\Sigma$. Consequently the absolute-absolute rest masses of particles and bodies in $\hat{\hat{\rho}}$ are absolutely at rest always relative to 3-observers in $\Sigma$, although they are actually in absolute-absolute motions at varying magnitudes of $\hat{\hat{V}}_d$ and $\hat{\hat{a}}$ with respect to '3-observers' $\hat{\hat{\Sigma}}$. We conclude again that not only is NAAM in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ non-observable and non-detectable to 3-observers in $\Sigma$, but that it does not exist as a theory of motion with respect to these observers.

Indeed since discrete 'one-dimensional' absolute-absolute rest masses $\hat{\hat{m}}_0$, $\hat{\hat{M}}_0$ of particles and bodies do not exist in the perfectly homogeneous 'one-dimensional' absolute-absolute space $\hat{\hat{\rho}}$ with respect to 3-observers in the physical Euclidean 3-space $\Sigma$, but $\hat{\hat{\rho}}$ contains a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point along its 'length' with respect to these observers, as deduced in the preceding sub-section, a theory of gravity and a theory of motion (i.e. NAAG and NAAM), do not exist (or have no meaning) in the absolutely homogeneous 'two-dimensional' absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ relative to observers in $(\Sigma, ct)$.

Now the flat absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ (the Newtonian absolute spacetime), and NAAG and NAAM (or the Newtonian mechanics) in it, are the outward manifestations (embedded in the flat relativistic spacetime $(\Sigma, ct)$), of the flat absolute-absolute intrinsic-intrinsic spacetime $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ (the Newtonian absolute intrinsic spacetime), and $\phi\phi$NAAG and $\phi\phi$NAAM (the intrinsic Newtonian mechanics) in it. Just as Eqs. (1) – (5) of [2] in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ are the same as Eqs. (1) – (5) above with respect to 3-observers in $\Sigma$, Eqs. (6) – (11) of [2] of $\phi\phi$NAAG in $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$, are the same as the following with respect to 3-observers in $\Sigma$

$$\phi\phi\hat{\hat{\Phi}}(\phi\phi\hat{\hat{r}}) = -\frac{1}{2}\phi\phi\hat{\hat{V}}_g(\phi\phi\hat{\hat{r}})^2 \equiv 0 \times \phi\hat{\Phi}(\phi\hat{r}) = 0 \tag{12}$$

$$\phi\phi\hat{\hat{g}}(\phi\phi\hat{\hat{r}}) = \frac{1}{2}\frac{d}{d\phi\phi\hat{\hat{r}}}(\phi\phi\hat{\hat{V}}_g(\phi\phi\hat{\hat{r}})^2) \equiv 0 \times \phi\hat{g}(\phi\hat{r}) = 0 \tag{13}$$

$$\phi\phi\hat{\hat{U}}(\phi\phi\hat{\hat{r}}) = \phi\phi\hat{\hat{m}}_0\,\phi\phi\hat{\hat{\Phi}}(\phi\phi\hat{\hat{r}}) \equiv 0 \times \phi\hat{U}(\phi\hat{r}) = 0 \tag{14}$$

$$\phi\phi\hat{\hat{F}}_g(\phi\phi\hat{\hat{r}}) = \phi\phi\hat{\hat{m}}_0\,\phi\phi\hat{\hat{g}}(\phi\phi\hat{\hat{r}}) \equiv 0 \times \phi\hat{F}_g(\phi\hat{r}) = 0 \text{ and} \tag{15}$$

$$\frac{d^2\phi\phi\hat{\hat{r}}}{d\phi\phi\hat{\hat{t}}^2} = \phi\phi\hat{\hat{g}}(\phi\phi\hat{\hat{r}}) \equiv 0 \times \phi\hat{g}(\phi\hat{r}) = 0 \tag{16}$$

Equations (12) – (16) say that the absolute-absolute intrinsic-intrinsic rest mass $\phi\phi\hat{\hat{M}}_0$ of any magnitude in $\phi\phi\hat{\hat{\rho}}$, which establishes absolute-absolute intrinsic-intrinsic gravitational parameters $\phi\phi\hat{\hat{V}}_g(\phi\phi\hat{\hat{r}})$, $\phi\phi\hat{\hat{\Phi}}(\phi\phi\hat{\hat{r}})$ and $\phi\phi\hat{\hat{g}}(\phi\phi\hat{\hat{r}})$ of any magnitudes in $\phi\phi\hat{\hat{\rho}}$, is a source of zero absolute intrinsic gravitational speed, zero absolute intrinsic gravitational potential and zero absolute intrinsic gravitational acceleration (or field). It is hence absolutely not a source of intrinsic gravitational field with respect to 3-observers in $\Sigma$. We conclude from this that $\phi\phi$NAAG in $\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ does not exist as an intrinsic theory of gravity with respect to 3-observers in $\Sigma$.

Just as Eqs. (11) – (14) of part one of this paper [2] of NAAM on flat absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ with respect to 3-observers in $\Sigma$ are the same as Eqs. (8) – (11) with respect to these observers, Eqs. (15) – (18) of [2] of $\phi\phi$NAAM on flat absolute-absolute intrinsic-intrinsic spacetime $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ with respect to 3-observers in $\Sigma$, are the same as the following with respect to these observers,

$$\phi\phi\hat{\hat{p}} = \phi\phi\hat{\hat{m}}_0\,\phi\phi\hat{\hat{V}}_d \equiv 0 \times (\phi\hat{m}_0\,\phi\hat{V}_d) = 0 \times \phi\hat{p} = 0 \tag{17}$$

$$\phi\phi\hat{E}_{kin} = \frac{1}{2}\phi\phi\hat{\hat{m}}_0\phi\phi\hat{\hat{V}}_d^2 \equiv 0 \times (\frac{1}{2}\phi\hat{m}_0\phi\hat{V}_d^2) = 0 \times \phi\hat{E}_{\text{kin}} = 0 \quad (18)$$

$$\frac{d^2\phi\phi\hat{\hat{x}}}{d\phi\phi\hat{\hat{t}}^2} = \phi\phi\hat{\hat{a}} \equiv 0 \times \phi\hat{a} = 0 \;\text{ and} \quad (19)$$

$$\phi\phi\hat{\hat{F}} = \frac{d\phi\phi\hat{\hat{p}}}{d\phi\phi\hat{\hat{t}}} = \phi\phi\hat{\hat{m}}_0\phi\phi\hat{\hat{a}} \equiv 0 \times (\phi\hat{m}_0\phi\hat{a}) = 0 \times \phi\hat{F} = 0 \quad (20)$$

Equations (17) – (20) show that the absolute-absolute intrinsic-intrinsic rest mass $\phi\phi\hat{\hat{m}}_0$ of a particle or object, which possesses any magnitude of absolute-absolute intrinsic-intrinsic dynamical speed $\phi\phi\hat{\hat{V}}_d$ and any magnitude of absolute-absolute intrinsic-intrinsic inertial acceleration $\phi\phi\hat{\hat{a}}$ in $\phi\phi\hat{\hat{\rho}}$, possesses zero absolute intrinsic momentum $(0\times\phi\hat{p})$ and zero absolute intrinsic kinetic energy $(0\times\phi\hat{E}_{\text{kin}})$. Consequently the absolute-absolute intrinsic-intrinsic rest masses of particles and bodies are absolutely at rest always in $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ with respect to 3-observers in $\Sigma$, although they are actually in absolute-absolute intrinsic-intrinsic motions at varying absolute-absolute intrinsic-intrinsic dynamical speeds $\phi\phi\hat{\hat{V}}_d$ with respect to '3-observers' in $\phi\phi\hat{\hat{\Sigma}}$. We conclude again that $\phi\phi$NAAM in $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ does not exist (or is meaningless) as an intrinsic theory of motion with respect to 3-observers in $\Sigma$.

As a matter of fact, since the absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ is homogeneously filled with a 'massless dust particle' of absolute zero rest mass and absolute zero extension at every point of it relative to observers in spacetime $(\Sigma, ct)$, it is meaningless to talk of a theory of gravity (i.e. NAAG), a theory of motion (i.e. NAAM) or any other absolute-absolute law involving particles and fields in $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ relative to observers in $(\Sigma, ct)$. It is consequently meaningless to talk of an intrinsic theory of gravity (i.e. $\phi\phi$NAAG), an intrinsic theory of motion (i.e. $\phi\phi$NAAM) or any other absolute-absolute intrinsic-intrinsic law of physics involving intrinsic particles and intrinsic fields in $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$ relative to observers in $(\Sigma, ct)$.

In brief, absolute-absolute natural laws in the absolute-absolute spacetime are non-laws (or do not exist) and absolute-absolute intrinsic natural laws in the absolute-absolute intrinsic spacetime are non-intrinsic laws (or do not exist) relative to observers in spacetime. The perfect homogeneity, 'everywhere is the same' and simultaneity of the absolute-absolute spacetime and absolute-absolute intrinsic-intrinsic spacetime relative to observers in spacetime, discussed in sub-sections 1.2 through 1.4 guarantee these. In a proper book-keeping of the theories of gravity that actually exists in nature with respect to 3-observers in $\Sigma$, NAAG and NAAM must not be counted, since they do not exist.

Finally although the NAAG and NAAM and other absolute-absolute natural laws of physics must be rejected as theories of physics, the flat 'two-dimensional' absolute-absolute spacetime $(\hat{\hat{\rho}}, \hat{\hat{c}}\hat{\hat{t}})$ on which they operate, must not be so treated. Lest we would be throwing the bowl away with the water. The absolute-absolute time 'dimension' $\hat{\hat{c}}\hat{\hat{t}}$ will continue to serve its inalienable role as the universal synchronous time coordinate (or 'dimension') and the absolute-absolute time $\hat{\hat{t}}$ as the universal absolute time parameter in the present theory. Although the absolute-absolute space $\hat{\hat{\rho}}$ will be largely inert, but it cannot be discarded because of the important role of its non-unique orientation in the Euclidean 3-space $\Sigma$, as shall be found with further development. Likewise the $\phi\phi$NAAG and $\phi\phi$NAAM must be rejected, while the flat 'two-dimensional' absolute-absolute intrinsic-intrinsic spacetime $(\phi\phi\hat{\hat{\rho}}, \phi\phi\hat{\hat{c}}\phi\phi\hat{\hat{t}})$, on which they operate, must be retained for the very crucial roles they will play in black hole physics and cosmological model at a later stage of the present theory.

## References


1. Joseph A. O. A. Formulating theories of gravity/intrinsic gravity and motion/intrinsic motion and their union at the first stage of evolutions of spacetime/intrinsic spacetime and parameters/intrinsic parameters in a gravitational field. Part II. *The Fundament. Theory (M)*, Article 12, v.1(3A).
2. Joseph A. O. A. Incorporating the absolute-absolute spacetime and its underlying absolute-absolute intrinsic-intrinsic spacetime into physics. Part I. *The Fundament. Theory (M)*, Article 18, v.1(3C) (Art. 14).
3. Joseph A. O. J. Particularization of the sequence of spacetime/intrinsic spacetime geometries and associated sequence of theories in a metric force field to the gravitational field. http://vixra.org/abs/1109-0031; *The Fundament. Theory (M)*, Article 9, v.1(2A).
4. Joseph A. O. J. Formulating theories of gravity/intrinsic gravity and motion/intrinsic motion and their union at the second stage of evolutions of spacetime/intrinsic spacetime and parameters/intrinsic parameters in a gravitational field. Part III. *The Fundament. Theory (M)*, Article 16, v.1(3B).
5. Joseph A. O. A. Formulating theories of gravity/intrinsic gravity and motion/intrinsic motion and their union at the second stage of evolutions of spacetime/intrinsic spacetime and parameters/intrinsic parameters in a gravitational field. Part I. http://vixra.org/abs/1207.0038; *The Fundament. Theory (M)*, Article 14, v.1(3B).
6. Joseph A. O. A. Formulating theories of gravity/intrinsic gravity and motion/intrinsic motion and their union at the first stage of evolutions of space-

time/intrinsic spacetime and parameters/intrinsic parameters in a gravitational field. Part II. *The Fundament. Theory (M)*, Article 13, v.1(3A).