

## 1.83: Point space

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A mathematical model of the space in which we live is the **point space**. Its elements are points. Objects in point space may be single points; finite sets of points like the centers of the atoms of a molecule; infinite discontinuous point sets like the centers of the atoms of an ideal crystal pattern; continuous point sets like straight lines, curves, planes, curved surfaces, etc.

Objects in point space are described by means of a coordinate system referred to point chosen as the origin O. An arbitrary point P is then described by its coordinates  $x, y, z$ .

The point space used in crystallography is a Euclidean space, *i.e.* an affine space where the scalar product is defined.

Crystal structures are described in point space. The vector space is a dual of the point space because to each pair of points in point space a vector in vector space can be associated.

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