

# De motu sphaericorum Corporum in fluidis.

Def. 1. Vim contripetam appello qua corpus attrahitur vel impellitur versus punctum aliquod quod ut centrum spectatur.

Def. 2. Et vim corporis seu corpori insitam qua in conatur perseverare in motu suo secundum lineam rectam.

Def. 3. Et resistenciam qua est medij regulariter impediens.

Def. 4. Exponentes quantitatum sunt alia quavis quantitates proportionales expositis.

<sup>Lex</sup> Hypoth 1. Sola vi insita corpus mota uniformiter in linea recta semper pergens si nil impediat.

<sup>Lex</sup> Hypoth 2. ~~Mutationem motus~~ <sup>mutacionem vel status in gradi vel quiescendi</sup> proportionalis esse vi impressae et fieri secundum lineam rectam qua vis illa imprimitur.

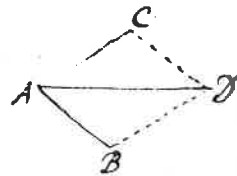
<sup>Lex</sup> Hypoth 3. Corporum dato spatio inclusorum eodem esse motus inter se sive spatium illud quiescat sive moveat id perpetuo et uniformiter in directum absq; motu circulari.

<sup>Lex</sup> Hypoth 4. Mutuis corporum actionibus commune centrum gravitatis non mutare statum suum motus vel quies. Constat ea ~~Lex 3~~ Lex 3

<sup>Lex</sup> Hypoth 5. Resistenciam medij esse ut medij illius densitas et corporis moti sphaerica superficies & velocitas conjunctim.

Lemma 1. Corpus viribus conjunctis diagonalium parallelogrammi eodem tempore describere quo latera separatim.

Si corpus dato tempore vi sola  $m$  ferretur ab  $A$  ad  $B$  et vi sola  $n$  ab  $A$  ad  $C$ , compleatur parallelogrammum  $ABDC$  et vi utraq; ferretur id eodem tempore ab  $A$  ad  $D$ . Nam quoniam vis  $m$  agit secundum lineam  $AC$  ipsi  $BD$  parallelam, haec vis <sup>per Lex 2</sup> nihil mutabit celeritatem accedendi ad lineam illam  $BD$  vi altera impressam. Accedet igitur corpus eodem tempore ad lineam  $BD$  sive vi  $AC$  imprimatur sive non, atq; adeo in fine illius temporis reperietur alicubi in linea illa  $BD$ . Eodem argumento in fine temporis ejusdem reperietur alicubi in linea  $CD$ , et proinde in utriusq; linea concursu  $D$  reperiri necesse est.



Lemma 2. Spatium quod corpus urgente quacumq; vi contripeta ipso motus initio describit, esse in duplicata ratione temporis.

## De Motu Sphaericorum Corporum in Fluidis

*Law 1.* A body always goes uniformly in a straight line by its innate force alone if nothing impedes it.

*Law 2.* A change of the state of motion or rest is proportional to the impressed force and occurs along the straight line in which that force is impressed.

*Law 3.* The relative motions of bodies contained in a given space are the same whether that space is at rest or whether it moves perpetually and uniformly in a straight line without circular motion.

*Law 4.* The common center of gravity does not alter its state of motion or rest through the mutual actions of bodies. This follows from Law 3.

*Law 5.* The resistance of a medium is as the density of that medium and as the spherical surface of the moving body and its velocity conjointly.

*Lemma 1.* A body describes by the action of combined forces the diagonal of a parallelogram in the same time as it would describe the sides by the action of separate forces.

*Lemma 2.* The space described by a body urged by any centripetal force at the beginning of its motion is as the square of the time.

Exponantur tempora per lineas  $A$   $B$   $C$   $D$   $b$   $d$   
 $AB$ ,  $AD$  Datis  $AB$  Ad proportiona-  
 les, et urgente vi centripeta equali  
 exponantur spatia descripta per areas  
 rectilneas  $ABF$   $ADH$  perpendicularibus  $BF$ ,  
 $DH$  et recta quavis  $A FH$  terminatas ut  
 exposuit Galileus, ~~et~~ <sup>urgente</sup> autem vi centri-  
 peta inequali ~~et~~ <sup>urgente</sup> exponantur  
 spatia descripta per areas  $ABC$ ,  $ADE$   
 curva quadis  $ACE$  quam recta  $A FH$  tangit  
 in  $A$ , comprehensas. Age rectam  $AE$  parallelis  
 $BF$ ,  $bf$ ,  $dh$  occurrentem in  $q$ ,  $z$ ,  $e$ , et ipsi  $bf$ ,  $dh$  occurrat  
 $A FH$  producta in  $f$  et  $h$ . Quoniam area  $ABC$  major est area  
 $ABF$  minor area  $ABq$  et area curvilinea  $ADEE$  major area  
 $ADH$  minor area  $ADEq$  erit area  $ABC$  ad aream  $ADEq$  major  
 quam area  $ABF$  ad aream  $ADEq$  minor quam area  $ABq$  ad  
 aream  $ADH$  hoc est major quam area  $Abf$  ad aream  $Ade$   
 minor quam area  $Abg$  ad aream  $Adh$ . Diminuantur jam lineae  
 $AB$ ,  $AD$  in ratione sua data usq; dum puncta  $ABD$  coeunt et  
 linea  $Ae$  coincidet cum tangente  $Ah$ , adeoque ultimae rationes  
 $Abf$  ad  $Ade$  et  $Abg$  ad  $Adh$  evadent eadem cum ratione  $Abf$   
 ad  $Adh$ . Sed haec ratio est dupla rationis  $AB$  ad  $Ad$  seu  $AB$   
 ad  $AD$  ergo ratio  $ABC$  ad  $ADE$  ultimis illis intermedia iam fit  
 dupla rationis  $AB$  ad  $AD$  id est ratio ultima evanescens  
 spatiorum seu prima nascentium dupla est rationis temporum.

Lemma 3. Quantitates differentis sunt proportionales  
 sunt continui proportionalis. Ponatur  $A$  ad  $A-B$ , ut  $B$  ad  $B$   
 $-C$  &  $C$  ad  $C-D$  &c et dividendo fiet  $A$  ad  $B$  ut  $B$  ad  $C$  et  
 $C$  ad  $D$  &c

Lemma 4. Parallelogramma omnia circa datam Ellipsim  
 descripta, esse inter se equalia. Constat ex Coroll.

## De motu corporum in mediis non resistentibus.

Theorema 1. Gyrantha omnia radijs ad centrum ductis  
 areas temporibus proportionales describere.

Dividatur tempus in partes equalis, et prima temporis