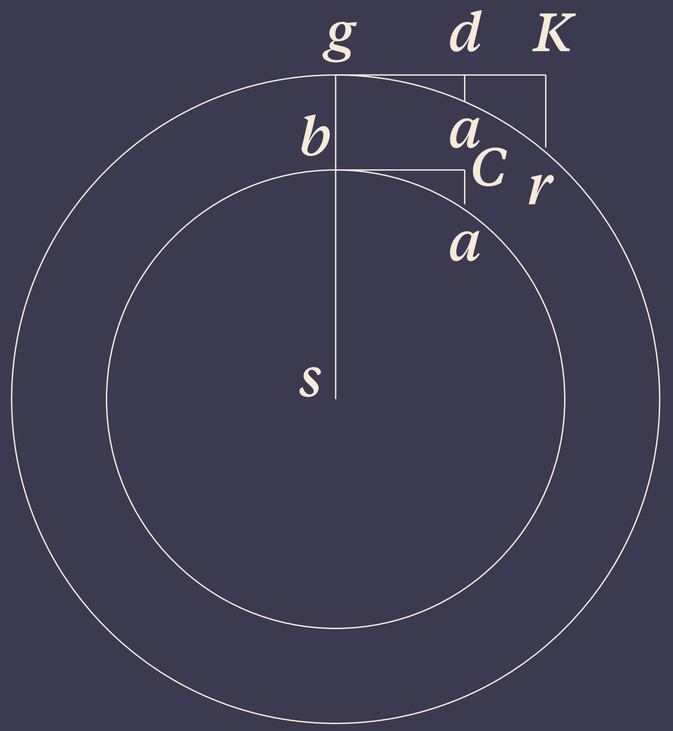
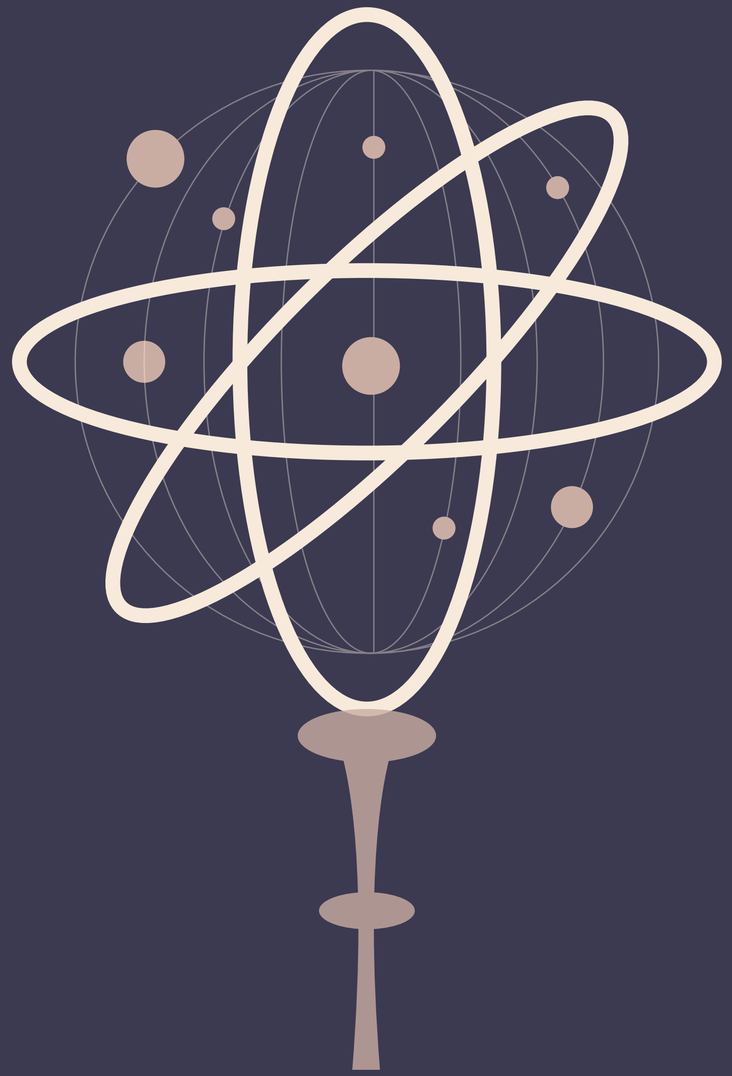
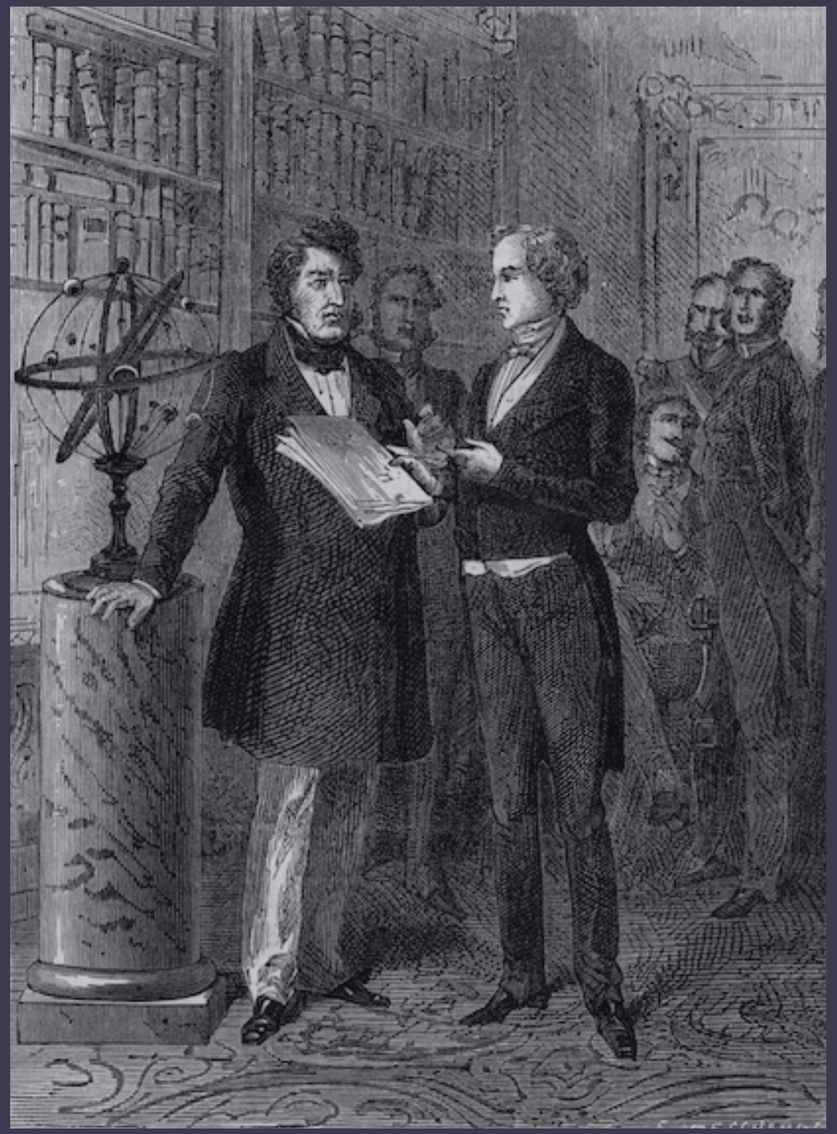
a working theory of components

@elyseholladay



Principia Mathematica





au bout de sa plume

> *If the tables do not strictly agree with the observations, we will certainly not be tempted to charge the law of universal gravitation with inadequacy.*

— URBAIN LE VERRIER

constant iteration

the tools we have today didn’t exist 10 years ago

changing the way we
***conceptualize** our work*

> *The system's promise is enabling a consistent experience spread across products and sustained with a dependable, predictable practice.*

— *NATHAN CURTIS*

Rectification de l'Orbite de la Planète en partant de $\alpha = 0,51$
et de $\varepsilon = 280$ grades pour première approximation

Perturbations.

1°.

La masse étant toujours prise égale à 0,0001 pour unité, il résulte de mes calculs, que si l'on prend pour le rapport de la distance moyenne d'~~Uranus~~ à X, $0,51 + \alpha$ on aura les perturbations:

$$\delta r = m'(20'',24 + 1'',81\alpha + 0'',083\alpha^2)\sin(n't - nt + \varepsilon' - \varepsilon)$$

L'inégalité correspondante de ♃ produite par Saturne, réduite à la même masse, et en prenant l'approximation [illegible] de la Théorie [illegible] égale à $9'',044 \times 38,3157 \times 0,324 = 1'',044\,(1,093.91) = 25'',4$. La formule précédente doit donner le même nombre, en y faisant $\alpha = 4,514$: elle donne $25'',3$

L'inégalité de ♃ produite par ♄ est de même $225'',59 \times 1,33594 \times 0,324 = 655'',59\,(\bar{1},086.81) = 27'',8$. La formule précédente donne pour $\alpha = 3,5317$ l'inégalité $27'',7$

Enfin l'inégalité de ♄ produite par ♅ est de même $98'',544 \times 1,9504 \times 0,924 = 98,544\,(\bar{1},400.67) = 18'',0$ et la formule précédente pour $\alpha = -1,2804$ donne $18'',0$. Ainsi la formule précédente est très exacte.

Soit $n = 4^g,7610$ le moyen mouvement annuel d'Uranus. On aura en grades:

$$n' = n\left\{0,51 + \frac{\alpha}{100}\right\}^{\frac{3}{2}}$$
$$= n(0,51)^{\frac{3}{2}} + \frac{3}{200}(0,51)^{\frac{1}{2}}\alpha + \frac{3}{80000}(0,51)^{-\frac{1}{2}}\alpha^2$$

ou bien

$$n' = 1^g,7340 + 0^g,05100\,\alpha + 0^g,000.250\,\alpha^2$$

formule qui pour $\alpha = 1$ fournit $n' = 1^g,7853$ et pour $\alpha = 3$ fournit $n' = 1^g,8892$; nombres qui sont ceux qu'on trouve directement pour $n(0,52)^{\frac{3}{2}}$ et $n(0,54)^{\frac{3}{2}}$.

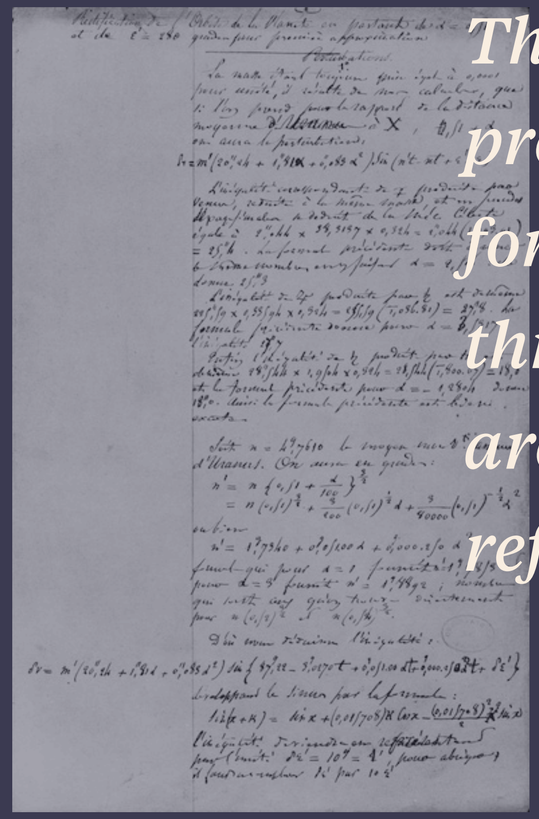
D'où nous tirerons l'inégalité:

$$\delta r = m'(20'',24 + 1'',81\alpha + 0'',083\alpha^2)\sin\{87^g,22 - 3^g,0270\,t + 0^g,05100\,\alpha t + 0^g,000.250\,\alpha^2 t + \delta\varepsilon'\}$$

Développant le sinus par la formule:

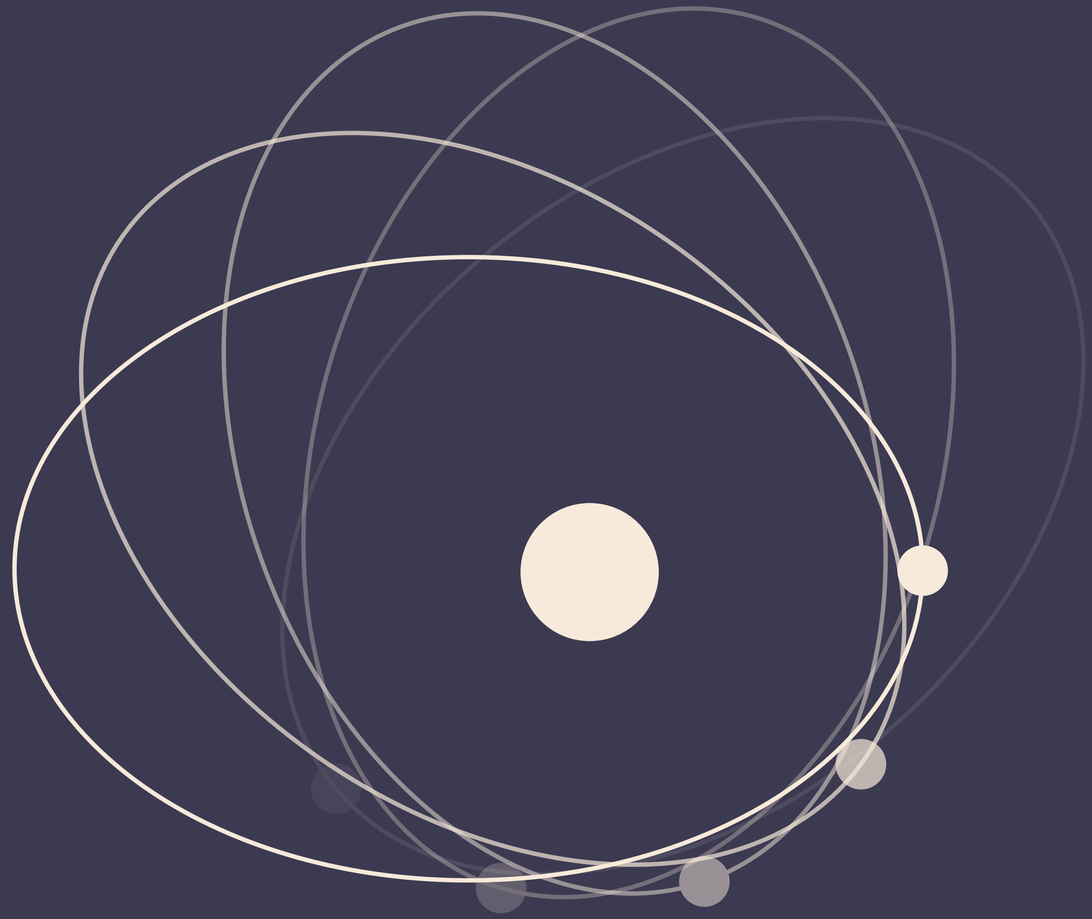
$$\sin(x + K) = \sin x + (0,015708)K\cos x - \frac{(0,015708)^2}{2}K^2\sin x$$

l'inégalité [illegible] en [illegible] par l'unité $\delta\varepsilon' = 10^g = 9'$, pour abréger, il faudra remplacer K par $10\,\varepsilon'$

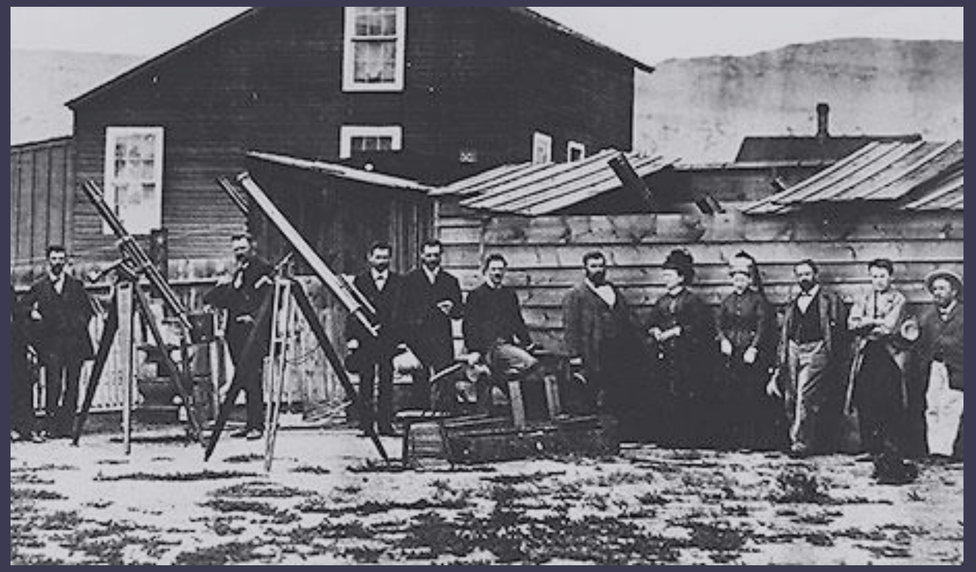


“The mathematical representations of Venus, Earth, and Mars all behaved properly. The calculated version of each planet produced a chart that matched the one formed by the observational record of the three material planets making their way around the sun. One, though, obstinately refused to conform: Mercury.”

—THOMAS LEVENSON




Mars
Earth
Venus
Mercury
Vulcan

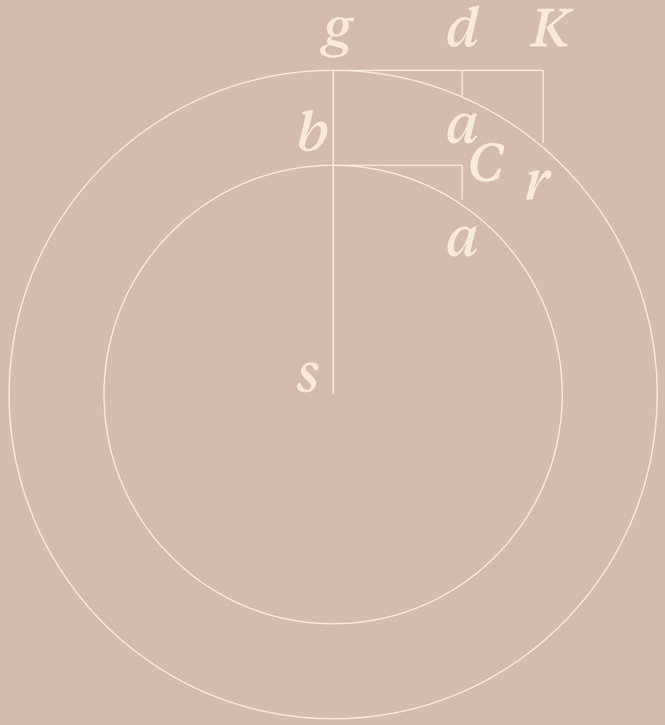


Vulcan fit the understanding of the world

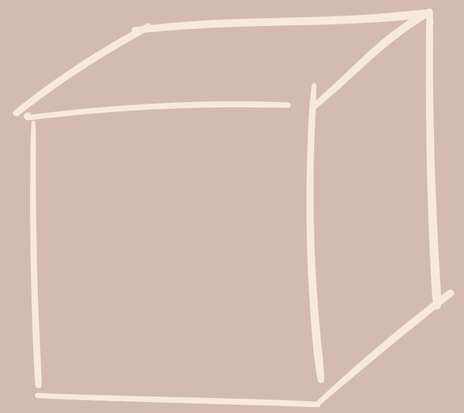
real science is a revision in progress, always

we're working towards the same core idea

the core idea



what makes a component useful?



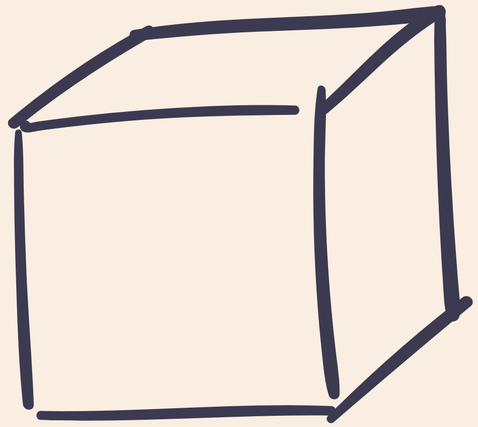
a component must be

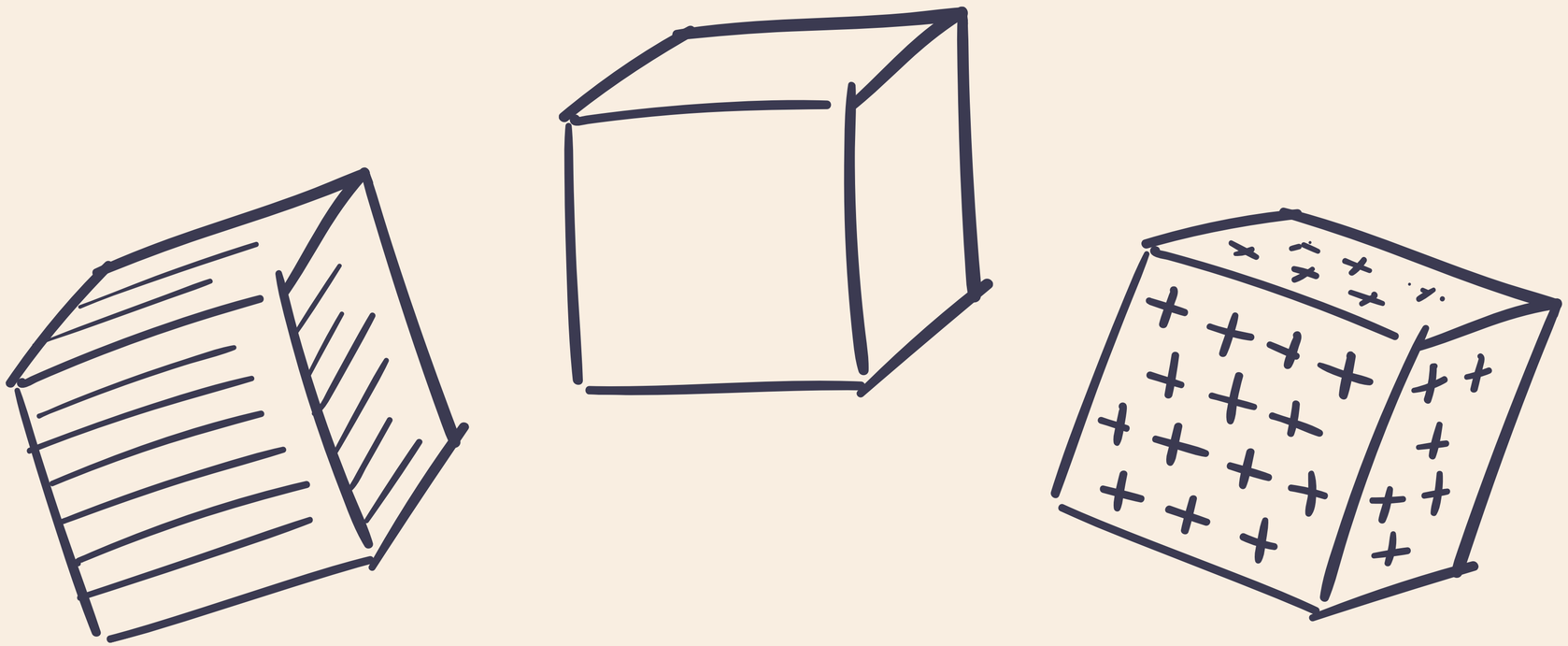
01 — easy to reason about

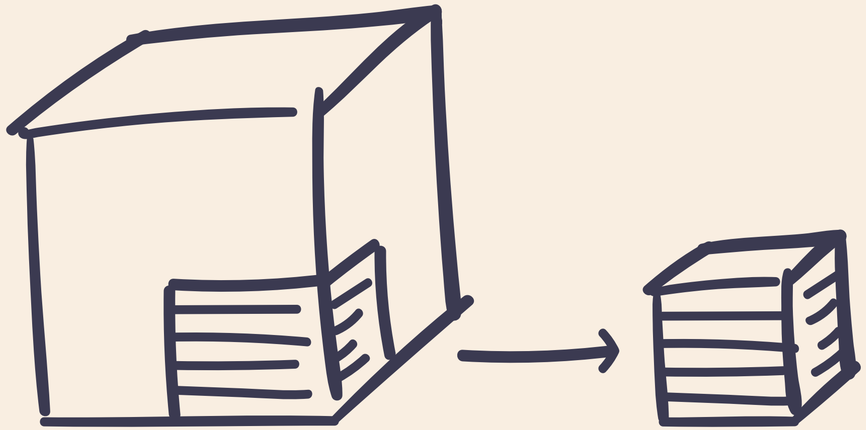
02 — context agnostic

03 — independent & isolated

01 — easy to reason about

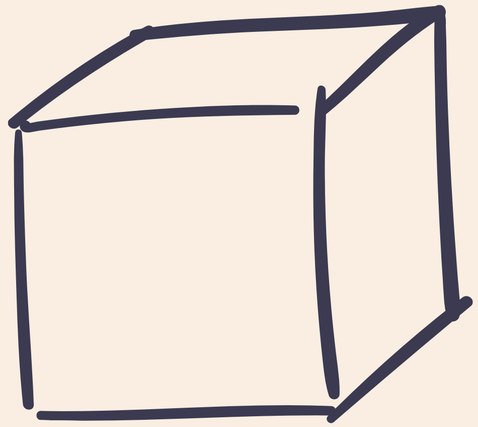


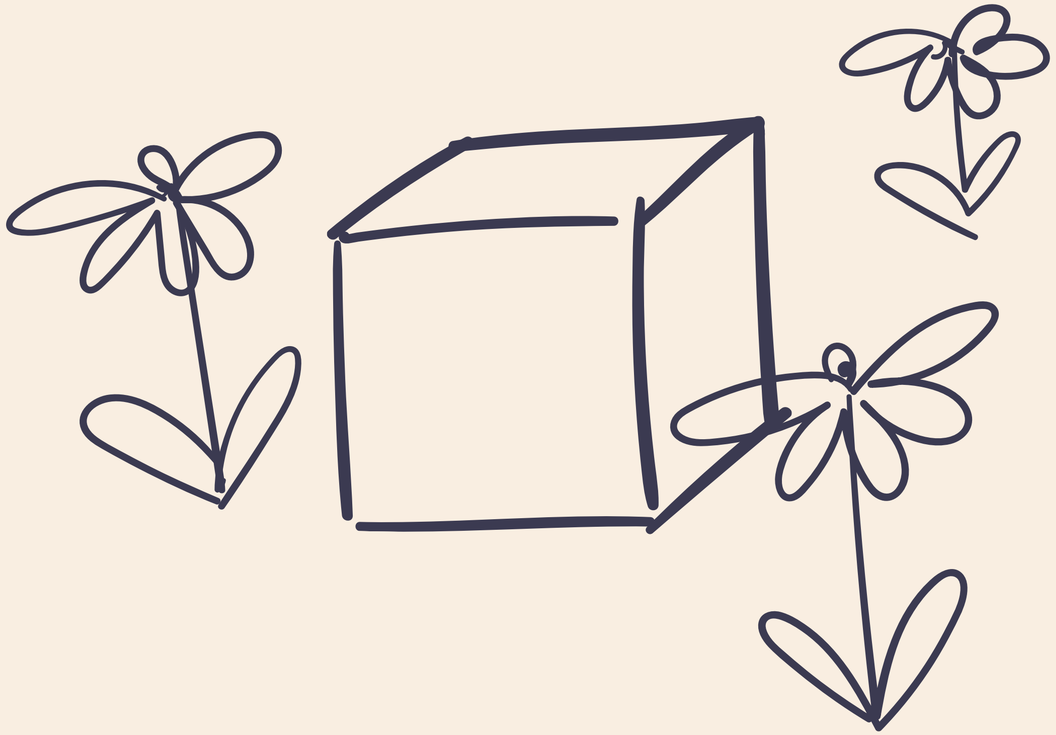


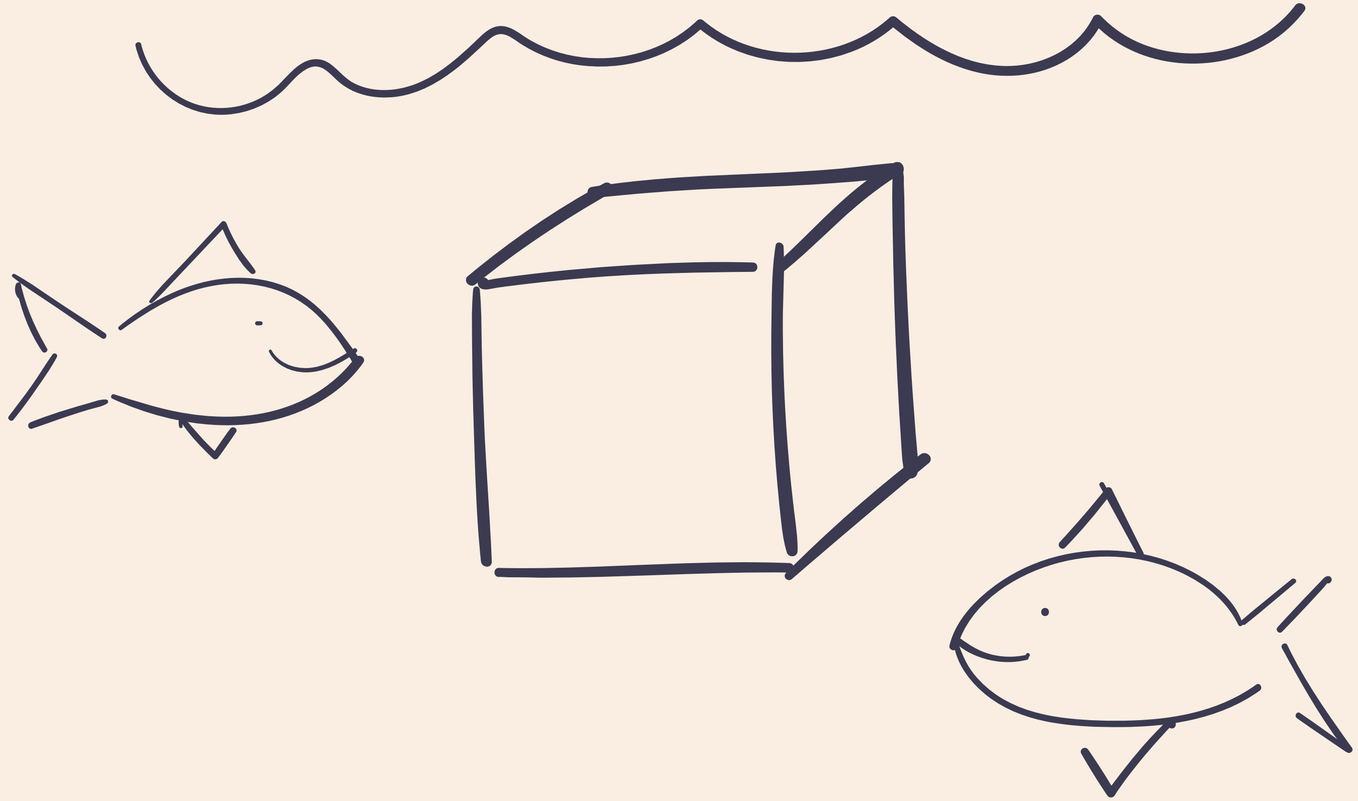


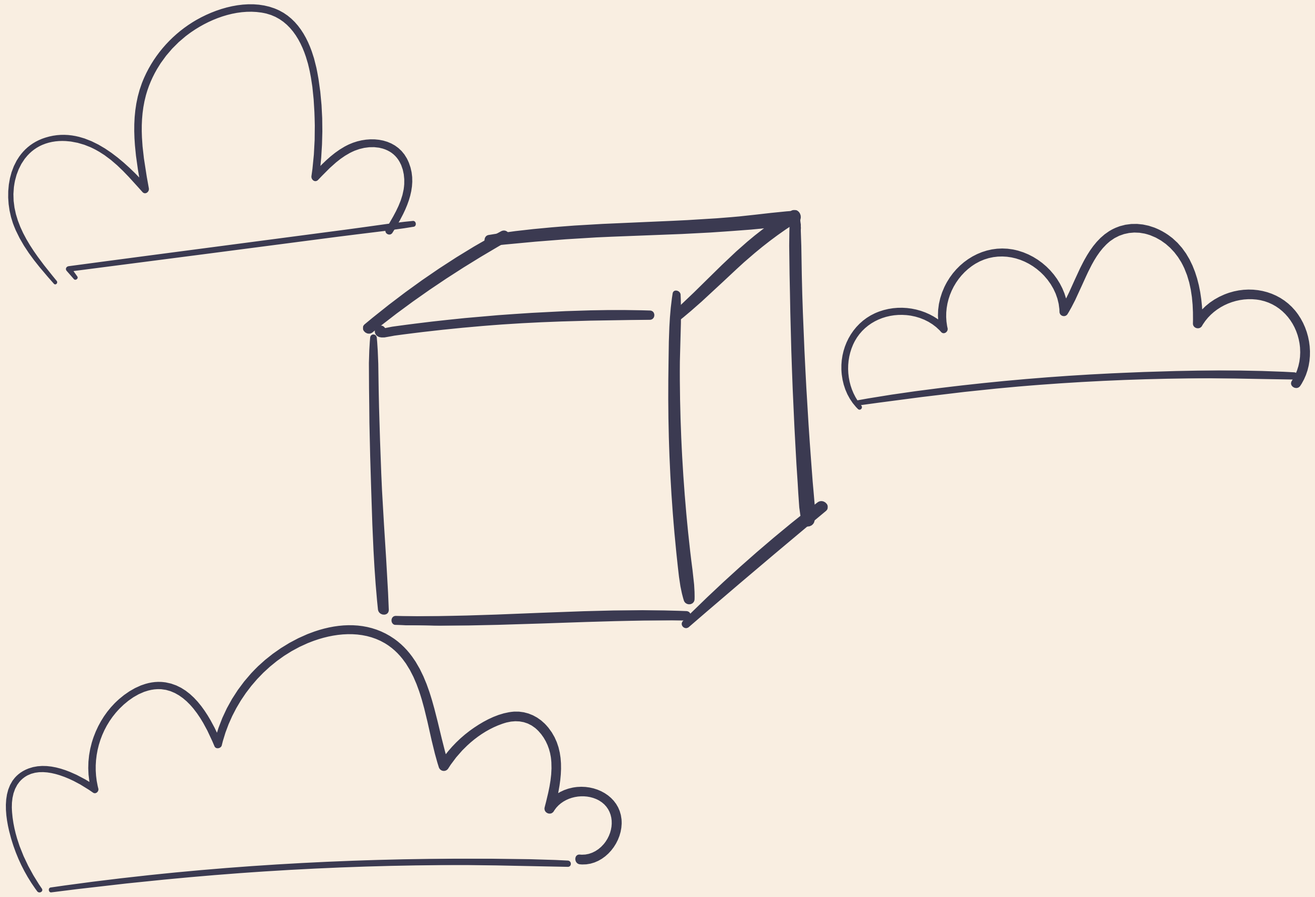
01 — easy to reason about

02 — context agnostic



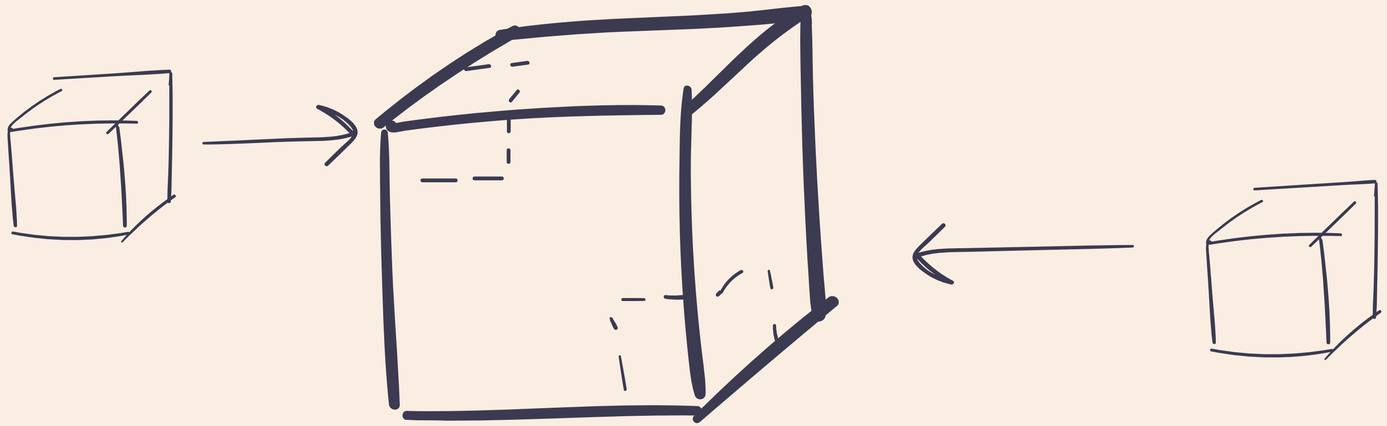


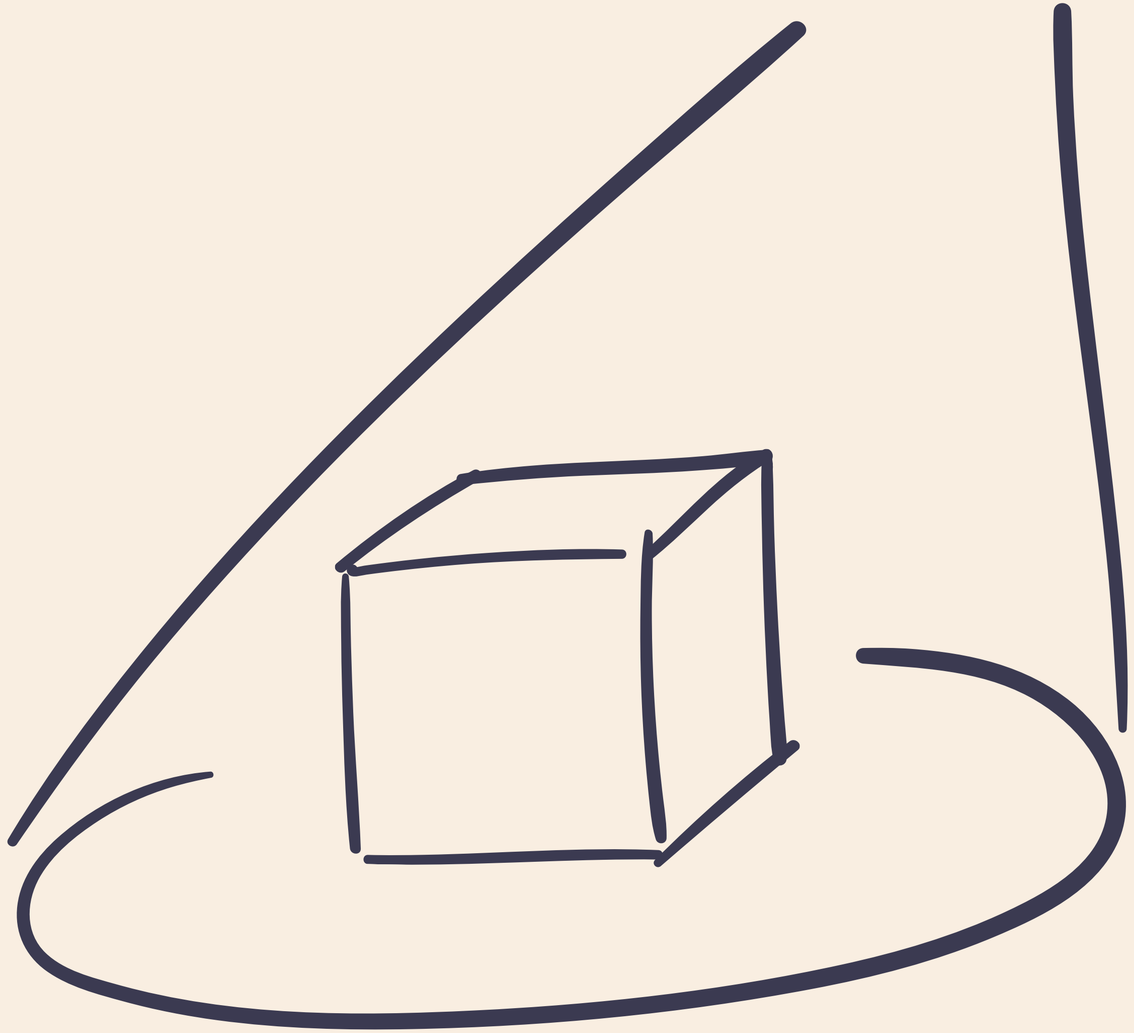




02 — context agnostic

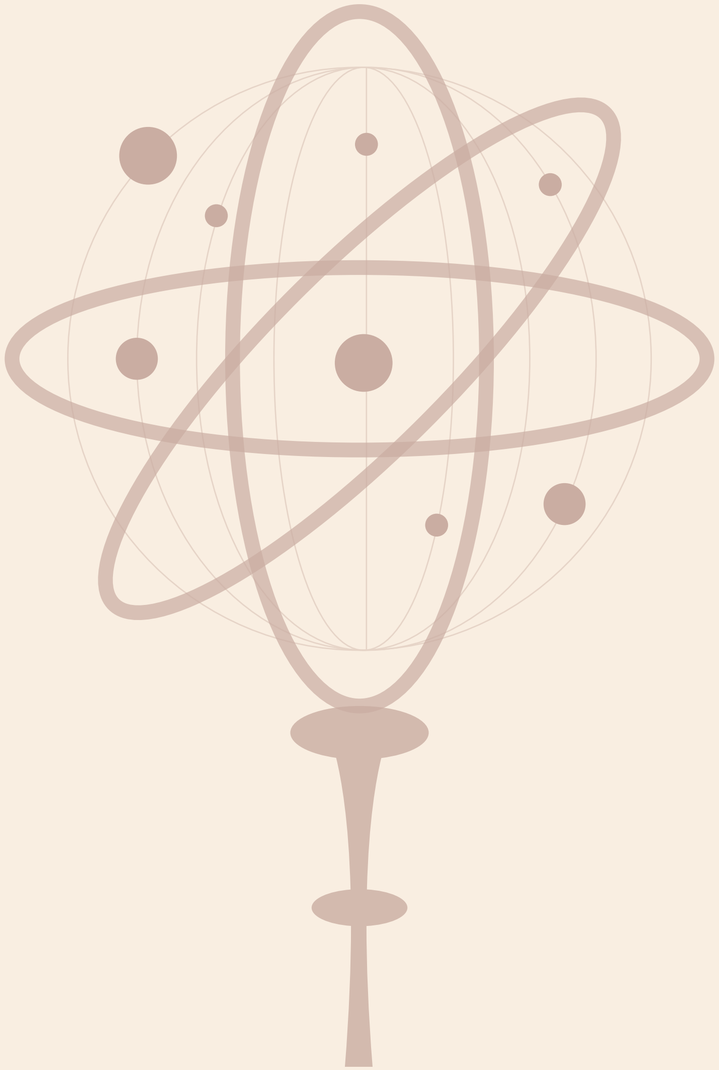
03 — independent and isolated





03 — independent and isolated

use components
by composition



theory
over tools

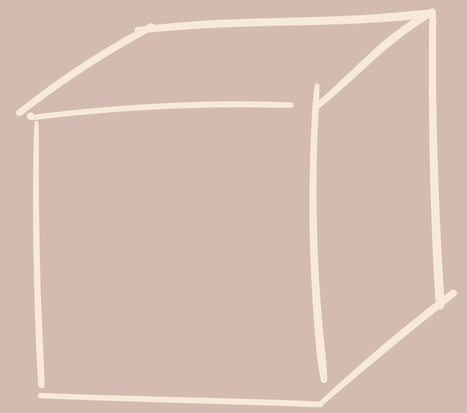

Mars
Earth
Venus
Mercury
Vulcan

Mercury's orbit in curved spacetime

finding new answers strengthens the theory

observation and concept

component checklist



easy to reason about

— *documented*
— *unit and visual tests*
— *appropriate default and error states*

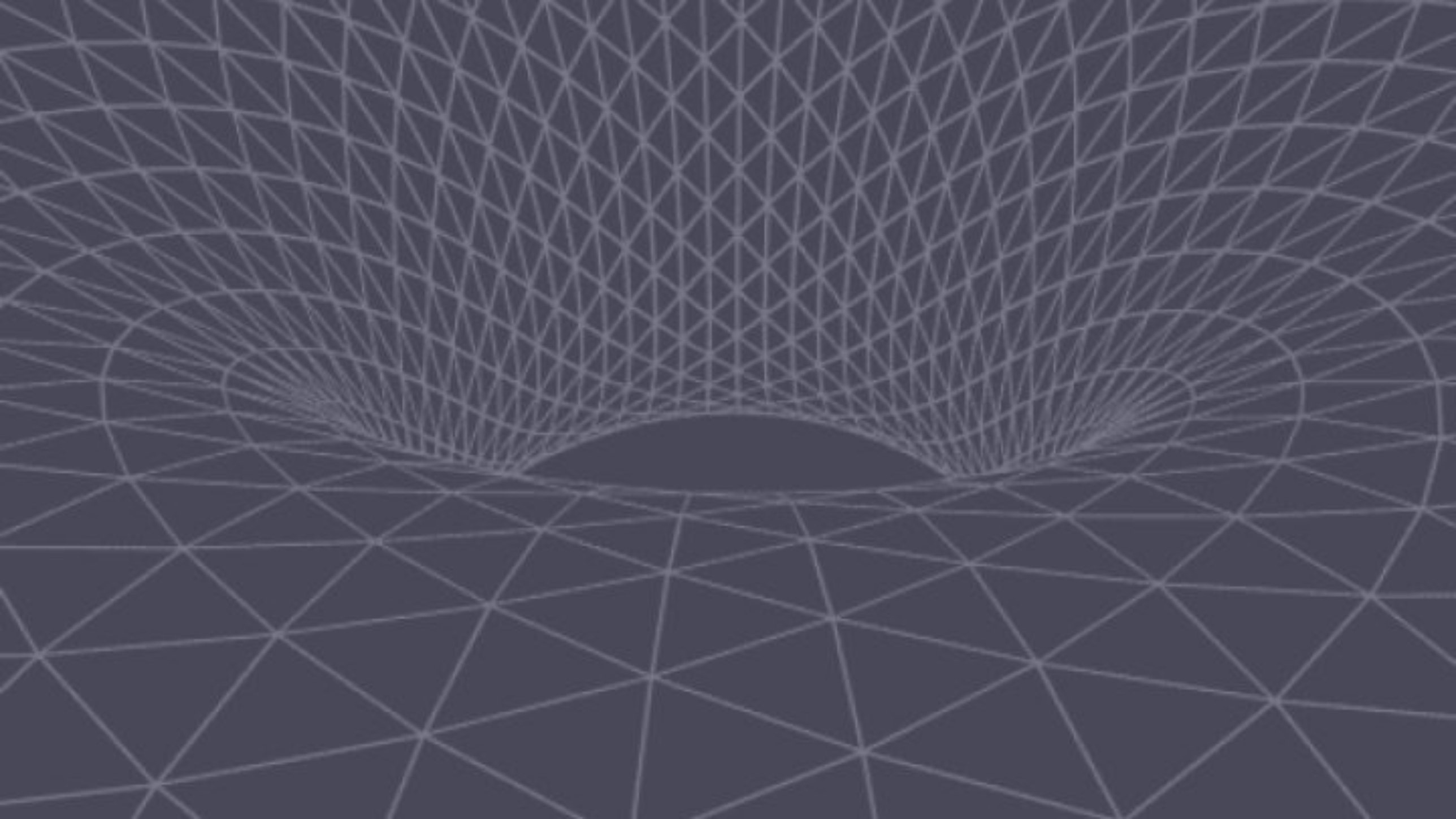
context agnostic

— *have no layout*
— *work in supported browsers and devices*
— *accessible*

independent & isolated

— *only affect itself*
— *define itself and its styles only in one place*
— *work standalone or when consumed*

component checklist

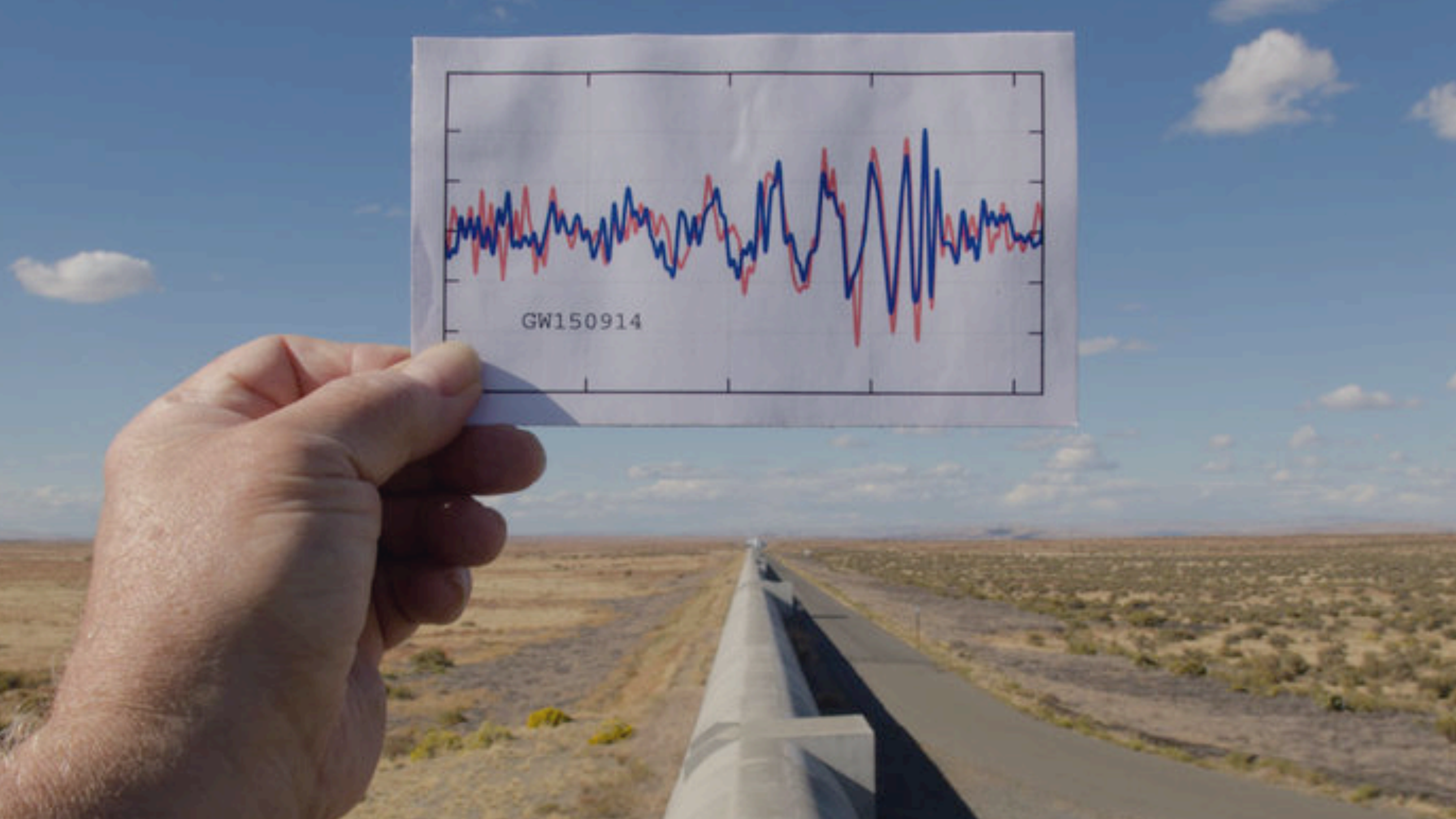


> *The pursuit of science is more than the pursuit of understanding.*

— KIP THORNE, LIGO

an experimental quest

when black holes collide,
they make a sound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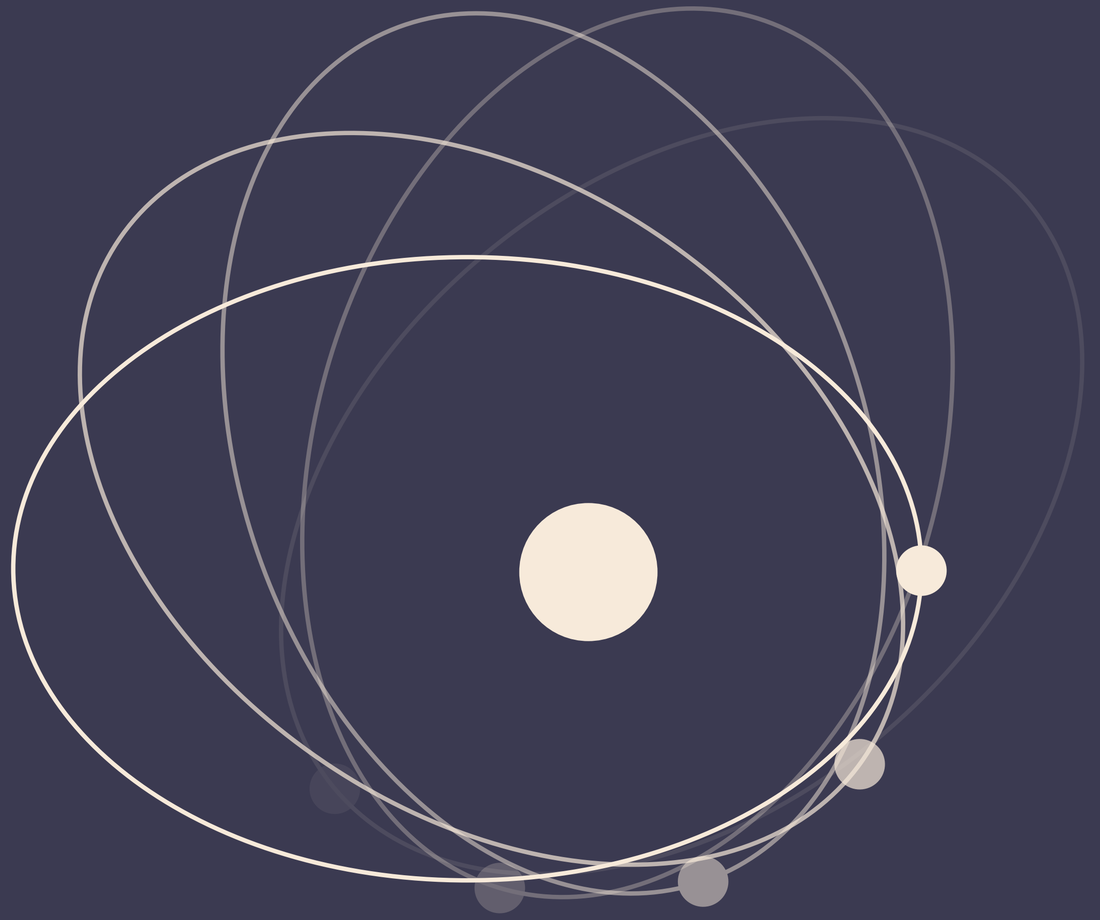
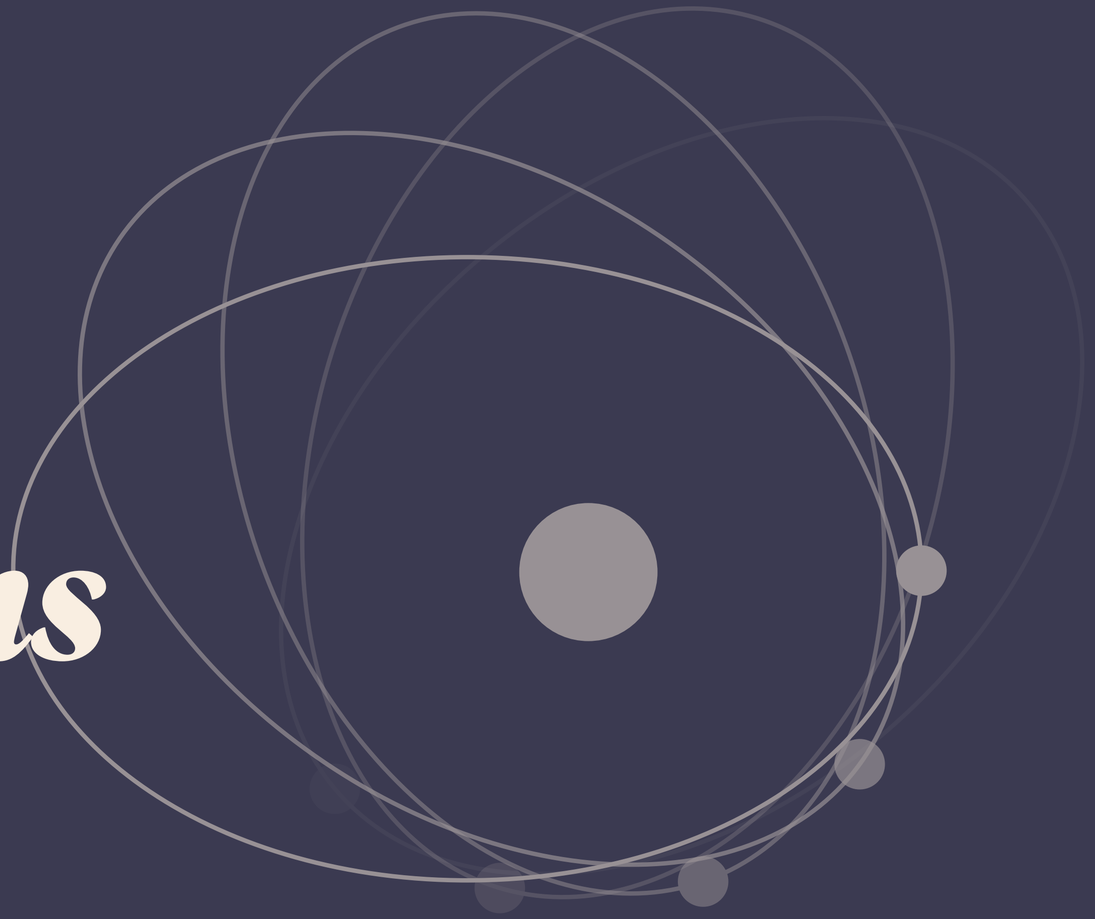


search for
new solutions



thank you

slides & resources

elyseholladay.github.io/theory

slides & illustrations

ainsley wagoner

typeface

tiempos, klim foundry