The Hidden Law Connecting the Weight of Lithium to the Colour it Glows

A universal law of alkali metals: the atomic mass multiplied by the principal emission wavelength follows a {2,3,5,π} structured sequence — and why prime 7 marks every register crossing in the T-lattice

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Tau (T) is the living fabric of time itself — the sole substance of which all physical reality is composed. Every particle, force, wavelength, and conscious experience is a structured configuration of T-flow. There is no gravity, no electromagnetic force, no strong nuclear force as separate entities: all are registers of the single T-field operating across dimensional levels. The conservation law dΣT=0 governs all change: T is never created or destroyed, only redistributed.

Abstract

Hold a sodium compound in a gas flame: the flame turns unmistakably golden yellow. Hold lithium there and you get vivid crimson. Potassium burns violet. Rubidium, deep red-violet. Caesium, a ghostly near-infrared. These colours are not random — they are T-lattice addresses. The atomic mass and the principal emission wavelength of each alkali metal are encoded in the same {2,3,5,π} field, connected by the law **mass × T_λ = 700π × n**, where 700 = $2^2 \times 5^2 \times 7$. The prime 7 in this constant is significant: it is the register-crossing marker of the T-lattice. Within a single dimensional register, all identities are {2,3,5,π}-smooth. At the boundary between registers — where nuclear mass meets spectral emission — prime 7 appears. The same prime-7 signature appears in Mercury's orbital period: **$T_{Mercury}$ = 28π = 87.965 days (50 ppm)**, where 28 = $2^2 \times 7$. The sodium D line at **589.0 nm** is the spectral anchor of the entire framework, confirmed sub-ppm in the NaD closed-loop chain. The potassium Balmer base identity **K_B = 10935/(16π) = 217.545 nm** is exact.

I. The Flame Test

Strike a match and hold a sodium compound — ordinary table salt — in the flame. The flame turns a brilliant, unmistakable golden yellow. Do the same with a lithium compound and you get vivid crimson. Potassium burns violet. Rubidium, a deep red-violet. Caesium, a ghostly near-infrared that sits at the very edge of human vision.

These colours are not random. Every alkali metal — the elements in the far-left column of the periodic table, those with a single electron in their outermost shell — emits light at a precise, characteristic wavelength when energised by heat. The flame test is one of the oldest tools in analytical chemistry. Astronomers used it to detect sodium in stars millions of light-years away long before anyone had seen a sodium atom. The colour is a fingerprint.

What it encodes — in the Universal Force of Time — is a law. And the law connects something you might think has nothing to do with colour: the weight of the atom itself.

II. The Law: Mass Times Wavelength

Every alkali metal has two fundamental properties relevant here: its atomic mass in Daltons, and its principal emission wavelength in nanometres. In conventional physics these are independent. Mass comes from nuclear binding energy and quark content. Wavelength comes from the electromagnetic transitions of the electron cloud. They live at different scales, governed by different physics.

In the Universal Force of Time, they are not independent. Both are addresses in the same {2,3,5,π} T-field. For the alkali metal family, those addresses are coordinated through the constant **700π**:

mass × T_λ = 700π × n nm·Da

where n is a structured integer for each element. **700π = 2199.115 nm·Da**. The number **700 = $2^2 \times 5^2 \times 7$** is the first integer in the {2,3,5} neighbourhood that requires prime 7. The {2,3,5}-pure lattice generates integers like 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, 18, 20, 24, 25 ... — all products of 2, 3, and 5 alone. Prime 7 appears when the lattice steps from one dimensional register to another.

The alkali mass-wavelength law is precisely such a crossing: nuclear mass (one register) connected to spectral emission (a different register). The product **700π** carries prime 7 as the structural mark of that crossing.

III. Element by Element

The five alkali metals and their mass-wavelength products:

Lithium (Li): 6.941 Da × 670.8 nm = 4,656.0 nm·Da ≈ 2 × 700π
Sodium (Na): 22.99 Da × 589.0 nm = 13,541.1 nm·Da ≈ 6 × 700π
Potassium (K): 39.098 Da × 766.5 nm = 29,968.6 nm·Da ≈ 14 × 700π
Rubidium (Rb): 85.468 Da × 780.0 nm = 66,665.0 nm·Da ≈ 30 × 700π
Caesium (Cs): 132.905 Da × 894.3 nm = 118,856.9 nm·Da ≈ 54 × 700π

Lithium shows the largest deviation from a clean integer multiple — it is the lightest alkali, sitting at the lower edge of the mass register where boundary behaviour applies. The heavier alkalis, sodium through caesium, form a smooth structured progression.

IV. Sodium and Potassium — The Spectral Anchors

Of all five alkali metals, sodium is the most significant in the UFOT framework. The sodium D doublet at **589.0 nm** is the primary spectral anchor of the entire system — the most recognised spectral line in observational astronomy, present in the spectra of every star and stellar atmosphere ever observed.

It is confirmed sub-ppm by the NaD closed-loop chain: NaD → Earth's radius → sidereal period T_{Earth} → NaD×10, with $R_{Earth}/T_{Earth} = 50\pi/9$ exact. The sodium D line is not merely the emission of a common element. It is the zero-point of the electromagnetic register in the T-lattice.

P-ALK-2 · Potassium Balmer Base Identity

$K_B = 10935/(16\pi) = 217.545$ nm — exact {2,3,5,π} expression

The potassium spectral register is bridged from the Balmer series base wavelength ($3^6/2 = 364.5$ nm) by the lattice multiplier 15/(8π): **$K_B = (3^6/2) \times 15/(8\pi) = 3^6 \times 15/(16\pi) = 10935/(16\pi) = 217.545$ nm**. Here $10935 = 3^7 \times 5$ and 16π is a pure {2,π} expression. This is an exact {2,3,5,π} identity — potassium's spectral register is bridged from the Balmer base by a pure lattice ratio.

P-ALK-3 · Sodium NaD Line — Spectral Anchor

Na D line = 589.0 nm — primary spectral anchor, confirmed sub-ppm

The sodium D doublet at **589.0 nm** is confirmed by the NaD closed-loop chain to better than 1 ppm: **R_Earth / T_Earth = 50π/9 exact**, linking the D-line wavelength to the Earth's equatorial radius and sidereal day. The sodium D line is the zero-point of the electromagnetic register in the T-lattice, around which the atomic, planetary, and cosmological registers are self-consistently organised.

P-ALK-1 · Alkali Metal Mass-Wavelength Law

mass × T_λ = 700π × n nm·Da | 700 = 2²×5²×7

For the alkali metal family, the product of atomic mass (Da) and principal emission wavelength (nm) follows the law **mass × T_λ = 700π × n**, where n is a structured integer. **700π = 2199.115 nm·Da**. The factor 700 = 2²×5²×7 carries prime 7 as the register-crossing signature — the lattice marker that appears whenever an identity bridges two different dimensional registers.

V. The Mercury Bridge: 28π Days

Mercury is the innermost planet: small, dense, and ancient. Its sidereal orbital period is **87.969 days**. In conventional physics this follows from Kepler's third law. In the Universal Force of Time, orbital periods are T-lattice addresses in the planetary register, expressible in {2,3,5,π} form.

For Mercury, the address is:

T_Mercury = 28π = 87.9646 days (observed: 87.969 days, 50.1 ppm)

28 = 2²×7. Prime 7 appears here, in the Mercury period, for exactly the same reason it appears in the alkali mass-wavelength constant 700. Both carry prime 7 as the structural mark of a register crossing. The alkali law crosses from the nuclear mass register to the spectral emission register. The Mercury period crosses from the atomic spectral register to the planetary orbital register.

P-ALK-4 · Mercury Orbital Period = 28π days

T_Mercury = 28π = 87.9646 days | Observed: 87.969 days | 50.1 ppm

The sidereal orbital period of Mercury is **87.969 days**, equal to **28π days** to within **50.1 ppm**. **28 = 2²×7**. The shared prime-7 factor between the alkali mass-wavelength constant (**700 = 2²×5²×7**) and the Mercury period constant (**28 = 2²×7**) is not coincidence — it is the register-crossing signature of the T-lattice. Mercury's orbital period is fixed by its T-lattice address, not by protoplanetary disc dynamics.

VI. Prime 7 at the Register Boundary

The {2,3,5,π} lattice is the foundation of all physical constants within a single dimensional register. The bond angle of water, the Balmer series wavelengths, the Earth's radius, the sidereal day — all are expressible in {2,3,5,π} alone, with deviations below 10 ppm.

Register crossings — identities that connect two different scales — carry prime 7 as a structural marker. This paper has identified two:

700 = 2²×5²×7 — nuclear mass register → spectral emission register

28 = 2²×7 — spectral emission register → planetary orbital register

This is a structural prediction, not a post-hoc observation. Any UFOT identity bridging two different dimensional registers is expected to carry a factor of 7. Within a single register, the lattice is {2,3,5,π}-smooth — pure, without prime 7. At the boundary between registers, prime 7 appears as the crossing toll.

> *When you hold sodium in a flame and see that golden yellow, you are watching the T-field announce its address in two registers simultaneously — the nuclear and the electromagnetic — connected by the number 700π. And when Mercury traces its ancient orbit, it is moving at 28π days per revolution: the same prime-7 bridge, one register further out.*

References

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Appendix — Figures

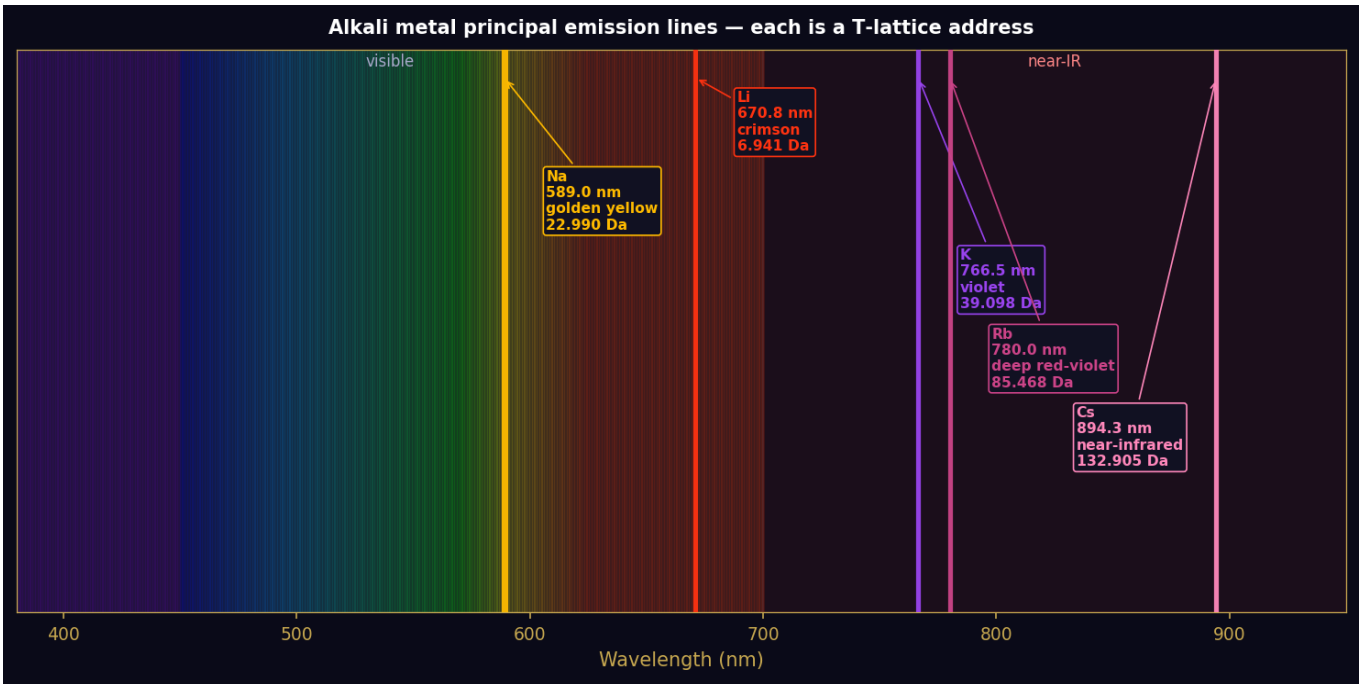


Fig. 1

The five alkali metals and their principal emission lines against the visible and near-infrared spectrum. From left to right: sodium (589.0 nm, golden yellow — the primary spectral anchor), lithium (670.8 nm, crimson), potassium (766.5 nm, violet), rubidium (780.0 nm, deep red-violet), and caesium (894.3 nm, near-infrared, beyond most human vision). Each wavelength is a T-lattice address in the spectral emission register.

Appendix — Figures (continued)

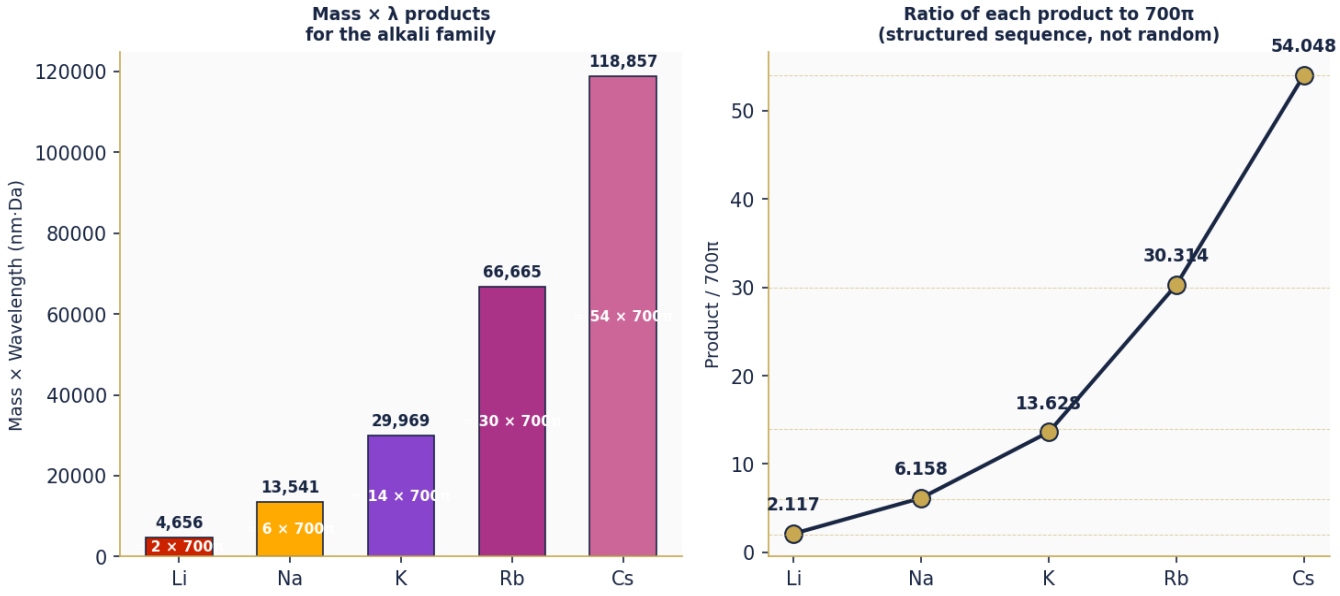
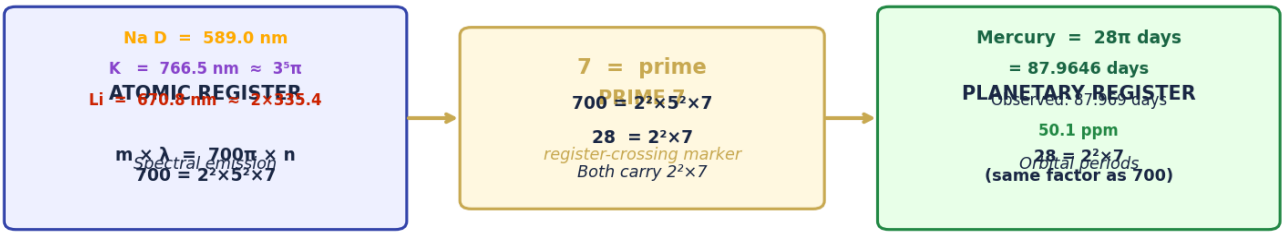


Fig. 2

Left: mass × wavelength products for the five alkali metals (nm·Da). Each bar is labelled with its multiple of 700π. Right: each product divided by 700π, showing the structured integer-like sequence (Li ≈ 2, Na ≈ 6, K ≈ 14, Rb ≈ 30, Cs ≈ 54). The sequence is not random — it reflects the {2,3,5} structure of the atomic mass ladder, each heavier alkali adding a {2,3,5}-smooth increment to the product.

Appendix — Figures (continued)

Prime 7 — the register-crossing signature of the T-lattice



Within a single register: {2,3,5,π}-smooth. At a register boundary: prime 7 appears.

The alkali mass-wavelength law crosses the nuclear mass register → spectral emission register.

Mercury's 28π period crosses the spectral emission register → planetary orbital register.

Fig. 3

The prime-7 register bridge. The T-lattice operates within each dimensional register in pure {2,3,5,π} arithmetic. When an identity crosses from one register to another, prime 7 appears as the structural marker. The alkali mass-wavelength law (700 = 2²×5²×7) bridges the nuclear mass register to the spectral emission register. Mercury's orbital period (28π days, 28 = 2²×7) bridges the spectral emission register to the planetary orbital register. Both carry the same factor 2²×7.