# EN_5: Theoretical Framework of the Electron and Cooper Pairs

**10.5281/zenodo.17172925**

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## 1. Electron as a surface

The electron is not a point particle.
It is an **extended surface** that defines its own orbital.
Within the atom, the electron **is the orbital**: its position is not defined; the particle and the envelope coincide.

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## 2. Minimum contour closure

The electron has a **minimum geometric closure**:

$n = 137$

- Associated with the **first atomic orbital**
- Defines the **geometric core of stability** of the electron
- Mass = confined wave in this contour
- If confinement is broken, the wave is released → free energy

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## 3. Cooper Pairs

A **Cooper pair** is the **exact geometric binding** of two electron-surfaces:

- Bound to a **hole in the conductive lattice**
- Preserve the contour $k\,n\,\lambda_e$ as long as the structure exists
- $k = 2$ → minimum contour for two electrons → most stable pair
- Irreducible contour → maximum stability
- If the geometry is broken → the pair is extinguished and the waves are released as radiation

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# 4. Hierarchy of pairs

When an electron comes from a **higher orbital** ( $n > 137$ ):

- Pair contour:

$$L_{\text{Cooper}} = 2 \cdot n_{\text{orbital}} \cdot \lambda_e$$

- Longer pairs → more energetic → less stable
- **Energy and stability depend only on the geometry of the contour**
- A **natural hierarchy of pairs** is formed according to the orbital of origin

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# 5. Geometric irreducibility and primacy of primes

- Stability requires that the contour be **irreducible**
- Prime values of $k$ → non-factorizable contours → maximum stability
- Composite values → internal subcontours → lower stability
- $k \geq 2$ → necessary condition
- $k = 2$ → minimum for a stable Cooper pair

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# 6. Conclusion

- The electron is completely described as a **confined surface**
- Stability of Cooper pairs depends **exclusively on geometry**
- The most stable pairs come from the **first orbital** ( $n = 137, k = 2$ )
- Higher orbitals produce more energetic, less stable pairs
- The whole theory is **deterministic and geometric**, without probabilities or quantum mechanics

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**End of EN_5**