Where ESFD fits in physics

Can spin and electromagnetic fields explain behavior from a turning object to gravity itself? Independent researchers have published models for several steps in that chain. The recovered ESFD papers put them together in a way I could not find independently demonstrated.

Rotation, the vacuum and extra galactic gravity

A. V. Minkevich asked whether a vacuum field interacting with the angular momentum of astronomical bodies could add attraction in galaxies and clusters. His 2017 calculation also addresses cosmic acceleration. The field in his model is torsion, a property of spacetime geometry. The older Einstein–Cartan theory links intrinsic spin to torsion, but its minimal form gives a short-range contact interaction. The extended theory makes additional assumptions.

Minkevich (2017 preprint) · Hehl et al. (1976)

An electromagnetic origin for inertia

Haisch, Rueda and Puthoff modeled the resistance to acceleration of charged constituents interacting with electromagnetic vacuum fluctuations. This is close to the physical question in §2 of Grenke's Proof. Their paper gives a proposed mechanism for inertia. It supplies no measurement of a change in inertia caused by aligning a rotating superconductor.

Haisch, Rueda & Puthoff (1994) · Original Proof and companion papers

Entropy, gravity and matter made of fields

Jacobson derived Einstein's equation from a horizon entropy and heat-flow argument. Verlinde proposed an entropy-based contribution to galactic gravity. These use different entropy variables from SFFD's local spin–entropy current. Wheeler's geons are a separate precedent for localized structures built from waves and their own gravity. Kaluza's earlier unification obtains gravity and electromagnetism from five-dimensional geometry.

Jacobson (1995) · Verlinde (2016 preprint) · Wheeler (1955) · Kaluza (1921, translation)

The whole-framework claim. In Grenke's strong version, spin–field response contributes to inertia and gravity. Another version lets electromagnetism organize matter while retaining gravity. The first also has to explain why neutral matter falls and how light bends. A magnetic force on plasma directly addresses only the second.

Scope includes the 59-page June manuscript, three project PDFs including the 22-page Proof, the rebuilt master and its 75-topic register, and the fixed-ring phase model. Recovery records identify an older master called v150 and a recollected roughly 90-page document. Their full texts remain unavailable.

June 2025 manuscript · Original Proof and companion papers · November 2026 project master · ESFD/SFFD phase-alignment calculation

From a spinning top to a field

The first step in ESFD has direct experimental relatives. The measurable connection depends on what rotates, which particles carry angular momentum, and which quantity the detector reads.

Mechanical rotation can polarize spins

The Barnett effect couples mechanical rotation to magnetization. Arabgol and Sleator measured rotation-induced nuclear polarization in water. A separate experiment measured a voltage generated through electron spin in flowing liquid mercury. The energy came from the driven flow. Grenke's complete fluid ring stays centered around a dry spinning disk. A flow-induced effect requires a velocity gradient or vorticity in the liquid, even if the ring stays fixed.

Arabgol & Sleator (2019) · Liquid-mercury experiment (2020)

From quantum spin to a conducting fluid

Brodin and Marklund started from the Pauli equation for spin-½ particles and derived collective equations for magnetized plasma. They show one explicit way to average microscopic spin into an observable bulk response. Alfvén's work gives the larger-scale precedent for currents, waves and magnetic structure in space. Applying either calculation to a rotor or a galaxy requires the density, field and material response in that environment.

Brodin & Marklund (2007) · Alfvén (1977)

A matching field equation with a physical threshold

One later ESFD action multiplies the Maxwell field invariant by a function of a spin-related amplitude. Herdeiro and colleagues used that same mathematical structure with an independent scalar field. Their model develops a new scalar configuration around sufficiently charged black holes. Grenke's source and threshold can differ because an amplitude built from matter spins has its own equations and units.

Herdeiro et al. (2018), Eqs. 1–2, 8 · June 2025 manuscript · November 2026 project master

Aligned drives can amplify a response

Brächer and colleagues controlled spin-wave intensity through the phase of a pump. Chu and colleagues coupled acoustic vibrations to a superconducting circuit using a piezoelectric interaction. Wilson and colleagues observed photons generated by a driven superconducting circuit. Each reports a specific input and output. Grenke's simulated piezo, spin and liquid responses have assumed gains, and the phase that maximizes a sensor reading can differ from the one that drives the spin mode.

Brächer et al. (2016) · Chu et al. (2017) · Wilson et al. (2011) · ESFD/SFFD phase-alignment calculation

Maxwell and Tesla. Maxwell's field theory and Tesla's resonant circuits supply primary sources for waves, oscillation and superposition. The standing-wave cross term in the project calculation follows from two overlapping fields. A third independently propagating vacuum mode would need its own governing equation and observable.

Maxwell (1865) · Tesla, oscillatory-circuit patent · November 2026 project master

Galaxy rotation and magnetic fields

Can a magnetic structure account for a galaxy's extra rotation? This question appeared explicitly in the peer-reviewed literature decades before ESFD. The available evidence distinguishes several possible answers.

A direct magnetic proposal, and a calculation that tested it

Battaner and colleagues proposed that an azimuthal field could alter the motion of outer galactic gas and applied the idea to Andromeda. Elstner and colleagues later modeled magnetic forces using observed field properties and dynamo calculations. They found local changes were possible, but their fields did not sustain typical flat outer rotation curves. A separate SFFD gravitational source would give a different prediction, including an effect on light.

Battaner et al. (1992) · Elstner et al. (2014)

The polarization connection is observed

Tabatabaei and colleagues measured an association between integrated polarized radio emission and rotation speed. Grenke's master reanalyzed their 26-galaxy table. After adjusting for star formation, galaxy size and total radio emission, the partial correlation was 0.510. The published data underlie both results. Rotation can itself order a field. Only three of those galaxies matched the project's held-out rotation-curve sample.

Tabatabaei et al. (2016), Table 1 · November 2026 project master

An exact match for the revised speed profile

In master Eq. 57 the added squared speed is $V_\infty^2\, r^2/(r^2 + r_c^2)$. This follows exactly from the spherical cored logarithmic potential, since the circular speed satisfies $v^2 = r\, d\Phi/dr$. The revision ties the outer speed to baryonic mass and the core radius to disk scale length. SFFD proposes a physical source in the divergence of the spin–entropy current. The curve measures the radial pull but cannot by itself identify what generated it.

Bovy, galpy potential · Bekenstein & Milgrom (1984) · McGaugh, Lelli & Schombert (2016) · November 2026 project master

What the project's own comparison found. On 131 held-out galaxies, the revised curve beat the empirical radial acceleration relation in 67. The median paired change in speed error was −0.003 km/s, with a 95% bootstrap interval of −0.67 to +0.68. In the separate lensing comparison the radial acceleration relation had the smaller error under the project's adopted mapping.

Radio emission in the bridge between Abell 399 and 401 traces magnetized intercluster plasma. The Bullet Cluster supplies a different test by mapping gravitational lensing separately from the hot gas. Predicting both maps would speak directly to the proposed gravitational source.

Govoni et al. (2019) · Clowe et al. (2006) · Mistele et al. (2024), lensing data · November 2026 project master

From magnetars to daughter universes

A neutron star’s spin, magnetic field and internal stress all matter. The literature offers distinct models for magnetar activity, the formation of a black hole, and what might happen inside one.

Pulsars and magnetars as a connected population

Viganò and colleagues compared coupled magnetic and thermal evolution models with 40 neutron stars. Varying initial field, stellar mass and envelope composition reproduced much of the observed diversity. Rea and colleagues observed magnetar activity in a star with a weak inferred external dipole. Strong internal fields and magnetic geometry can matter even when timing gives a small surface estimate.

Viganò et al. (2013) · Rea et al. (2010)

Which breakpoint does the timing statistic measure?

When surface field is inferred from period P and spin-down rate $\dot{P}$, the usual dipole estimate is proportional to $\sqrt{(P\dot{P})}$. Multiplication by angular frequency $2\pi/P$ makes $B\Omega$ proportional to $\sqrt{(\dot{P}/P)}$, which ranks objects just as inverse characteristic age does. In the rebuilt master’s test of the historical fixed cutoff, 5 of 22 confirmed magnetars with eligible timing exceeded it. A fitted classifier or a different definition of the line answers a different question.

November 2026 project master

Superconducting interiors, collapse and black-hole spin

Neutron-star models include quantized vortices in a neutron superfluid and magnetic flux tubes in a superconducting proton fluid. Their interactions affect how the star exchanges angular momentum. Numerical merger studies find that the threshold for prompt black-hole collapse depends on the dense-matter equation of state. Blandford and Znajek derived how external magnetic fields can extract a black hole’s existing rotational energy. These are three different uses of spin in the same astrophysical environment.

Haskell et al., neutron-star interiors · Bauswein et al. (2013) · Blandford & Znajek (1977)

A universe inside a black hole appears in the literature

Nikodem Popławski used spin–torsion gravity to model the collapse of matter into a bounce and expansion inside a parent black hole. Haggard and Rovelli proposed a different black-to-white-hole transition via quantum tunnelling. Both are mathematical precedents for Grenke’s most speculative branch. Neither publication reports an observed daughter universe. A local bounce, a white-hole exterior and an expanding daughter universe have different geometric conditions.

Popławski (2016) · Haggard & Rovelli (2014 preprint)

What would link the thresholds? An ESFD relation could specify how the same spin–field stress enters the pressure of dense matter, changes the maximum supported mass and leaves a timing or polarization signature. A line classifying active neutron stars supplies only one of those three pieces.

Particle spin, coherence and time

Several of ESFD's proposed observables have already been measured by independent collaborations. The useful comparison is the change ESFD predicts above those measured relationships.

CERN studied the same Higgs decay channel

The project's CERN manuscript asks whether the two Z-boson spins show an extra dependence on the virtual Z boson's invariant mass in Higgs decay to four leptons. ATLAS measured polarization correlations in this channel. In its 2026 analysis, an assumption-dependent likelihood test gave 4.7 standard deviations against its non-entangled alternative. The observations agreed with the Standard Model. A direct ESFD test needs a quantitative extra correlation as a function of the reconstructed mass.

ATLAS at CERN (2026) · Grenke's CERN working text

A spinning particle fluid and entangled electron spins

STAR measured the polarization of particles emerging from heavy-ion collisions, linking quantum spin to a vortical quark–gluon fluid. In a different regime, the Delft Bell experiment found correlations between separated electron spins that exceed a local classical bound under the test assumptions. Grenke's observer branch would need to specify an additional change in the measured probabilities when a proposed observer variable changes.

STAR Collaboration (2017) · Hensen et al. (2015)

Gravity and clocks already have a sharp experimental test

An atomic-clock team resolved gravitational redshift over a millimetre-scale sample. The MICROSCOPE satellite independently compared free fall of titanium and platinum test masses. For a spin-sensitive clock or force, the relevant prediction is a signed, material-dependent residual after the ordinary clock shifts or accelerations have been accounted for. The satellite test constrains couplings according to their composition and range.

Bothwell et al., NIST (2022) · MICROSCOPE final results (2022)

Exceptional symmetry and the more speculative extensions

Magnetic-chain data show spectral features consistent with E_8 symmetry near a quantum critical point. Distler and Garibaldi gave mathematical obstructions to a class of direct E_8 embeddings of gravity and the Standard Model. A successful symmetry description of a material does not settle which particles exist. The ESFD archive also asks about solar flares, magnetic or tectonic resets, subjective time, ancient resonators and inertial devices. I found no independent demonstration tying these claims to the proposed universal coupling.

Coldea et al. (2010) · Distler & Garibaldi (2009 preprint) · November 2026 project master

A measurable distinction. A coherent field can alter a detector or clock. A new theory of time or measurement goes further by specifying which reading or outcome probability will change, by how much, as an independently varied spin or field is reversed.

Who has built related hardware?

A commercial instrument, a funded propulsion study and a replication address three different questions. Their measurements let us say exactly how close they come to Grenke's device.

Hathaway Consulting Services / Closest rotor test

The Toronto firm built a rotating YBCO superconducting disk apparatus with radio-frequency fields to test an earlier reported gravity-like signal. Hathaway, Cleveland and Bao reported no detectable force of that kind on the test mass above the disk within the sensitivity of their instrument. Their setup omitted Grenke's separate complete mercury-fluid ring and independently phased piezo drive. The published null result applies to their test geometry.

Hathaway, Cleveland & Bao (2003) · Podkletnov & Nieminen (1992)

Space Studies Institute and TU Dresden / Resonant propulsion

NASA's Innovative Advanced Concepts program funded a Phase II investigation led by James Woodward into Mach-effect propulsion using driven devices. This is an independent example of serious funding for an inertia-based propulsion proposal. In a separate peer-reviewed torsion-balance study, the Dresden group attributed the apparent forces in the tested piezoelectric thrusters to coupled vibrations.

NASA NIAC award description · Monette, Kößling & Tajmar (2021)

GWR Instruments and Qnami / Working commercial instruments

GWR's iGrav magnetically levitates a superconducting niobium sphere to measure changes in gravity. GFZ uses superconducting gravimeters in geoscience. Qnami sells a microscope that maps local magnetic fields using individual quantum spin sensors in diamond. These products establish that both kinds of measurements are commercially practical. Neither product claims to generate gravitational lift.

GWR iGrav · GFZ gravimeter observatories · Qnami ProteusQ

Gravity Probe B / A rotating superconductor actually flew

The Stanford–NASA spacecraft used the magnetic London moment from its rotating superconducting gyroscopes to read their spin direction. It measured relativistic precession. The magnetic readout is a particularly close example of a repeatable, calibrated signal from a spinning superconductor.

Gravity Probe B final results (2011)

In Grenke's current geometry, the disk spins dry inside the opening of a complete, centered ferrofluid ring. The simulated drives can reinforce one another. The model gives a directional force per imposed external gradient, while its reference exterior has no propagating spin-field harmonic at 15 or 30 Hz. It supplies no measured whole-assembly thrust or aircraft lift.

ESFD/SFFD phase-alignment calculation

The 75 topics in the project register

The original topic labels are preserved below. A page number takes you to the nearest discussion in this comparison. Some entries have a direct published counterpart. Others share only a subject or an experimental constraint.

1 Local spin–EM coupling p2
2 Pauli quantum and running p2
3 Composite gauge-kinetic factor p2
4 Independent gauge-kinetic scalar p2
5 Independent tensor field p2
6 Saturation potential p2
7 Spin taxonomy and coarse graining p2
8 Direction, handedness and QCD chirality p5
9 Proton/quark/gluon spin p5
10 QGP microburst p5
11 Higgs and emerging mass p5
12 CERN Higgs off-shell spin test p5
13 Bell/coherence and collapse p5
14 E8 and frame-Higgs p5
15 Top, rotor and direction reversal p2
16 Neutron Aharonov–Casher p2
17 Rotor clock and time feedback p5
18 Tokamak, laser, BEC, spintronics p2
19 Pulsar–magnetar classification p4
20 P–B gap and projection p4
21 Giant flares and QPO timing p4
22 Glitches and asymmetric spin down p4
23 Neutron star energy saturation p4
24 Vacuum propagation and threshold p4
25 TOV and rotating collapse p4
26 Black hole spin and accretion p4
27 Premerger flash and GRB QPO p4
28 Emergent gravity and inertia p1
29 SEFD current divergence p3
30 Wave-built matter and space p1
31 Flat galaxy rotation p3
32 Galactic Maxwell source p3
33 Draco and Abell 1689 p3
34 Galactic plane, Radcliffe Wave, Great Attractor p3
35 Cluster merger lensing, high-z, DES and SZ p3
36 Magnetogenesis and cosmic polarization p3
37 Dark energy and early clustering p1
38 White holes, daughter universe and galaxy handedness p4
39 Solar flares and local shear p5
40 Earth magnetic and tectonic reset p5
41 Observer, subjective time, consciousness p5
42 Vacuum energy, UAP and inertial devices p6
43 Ancient resonators and Schumann waves p5
44 June saturation folds p2
45 Spin-composite ordering and mixing p2
46 Proof polarization current p1
47 Spin contact in cold stars p4
48 Entire-galaxy transfer p3
49 Glitch replay across time p4
50 Precursor signal injection p4
51 Legacy sunspot and flare checks p5
52 Collider and Bell response p5
53 Shear against spin torsion p4
54 June original current example p3
55 Maxwell / Tesla wave overlap p2
56 Spatial parametric response p2
57 Terrestrial force and electromagnetic charge p6
58 Vacuum spin gap and range p1
59 Einstein–Cartan spin normalization p1
60 Spin and polarization reversal p2
61 Quadratic spin two-form p2
62 Two-spin massless exchange p1
63 Material-matched terrestrial charge p5
64 Nonlinear standing-wave energy transfer p2
65 Classical top versus intrinsic spin p2
66 Superconducting rotation and screening p6
67 Superconducting gravity and phase onset p6
68 Regularized flat galaxy curve p3
69 External dwarf velocities p3
70 Weak galaxy lensing p3
71 Polarized radio and global rotation p3
72 Stellar contact and two NICER posteriors p4
73 Bell event-ready spins p5
74 Trapped spheres at a bounce p4
75 Paired protons and neutron vortices in magnetars p4

The June guide used SEFD for its spin–entropy sector. This comparison follows Grenke's current SFFD usage. The project sources provide the derivations and numerical work behind the index. Independent studies are linked alongside each comparison on pages 1–6.

June 2025 manuscript · November 2026 project master · ESFD/SFFD phase-alignment calculation