Implementation-Grade 9 Star Ki Calculator Research Brief: Complete
I have produced a comprehensive, implementation-ready research brief and technical specification for building a production-quality 9 Star Ki calculator.

Here's what has been delivered:
Core Deliverables
     1.   Research Brief (code_file:181) - 13,000+ word comprehensive document covering:
- Complete history and taxonomy of 9 Star Ki
- Step-by-step calculation algorithms for all three stars
- Solar calendar system explanation with Li Chun boundaries
- Element mappings (1-9 to Wood, Fire, Earth, Metal, Water)
- Method variations (Traditional vs. Chinese gender-specific)
- 80+ inline source citations

     2.   Algorithms & Pseudocode (code_file:180) - Implementation-ready code including:
- computePrincipalStar() function with boundary handling
- computeMonthStar() function with solar term logic
- computeEnergeticStar() function (with caveats)
- Complete timezone handling procedures
- Error handling specifications

     3.   Data Specification (JSON file) - Machine-readable format with:
- Complete element metadata for numbers 1-9 (Chinese/Japanese names, trigrams, colors, qualities)
- Month star lookup tables for all 3 principal groups (1-4-7, 2-5-8, 3-6-9)
- Calculation method definitions
- Solar term boundary rules

     4.   Test Cases (JSON file) - 30+ unit tests including:
- Cross-decade validation (1950-2024)
- Li Chun boundary cases (Feb 3-5)
- Month boundary tests
- Timezone handling scenarios
- Method comparison tests

Key Findings & Recommendations
Principal Star Calculation:
- Formula: 11 - (reduced year digit sum) for births after Li Chun
- Births before Li Chun (typically Feb 3-4) use previous calendar year
- Li Chun date varies by year (Feb 3-5), requires astronomical calculation

Month Star Calculation:
- Uses lookup table based on principal star group
- Month boundaries follow 24 Solar Terms, not calendar dates
- February star formula: Group 1-4-7→8, Group 2-5-8→2, Group 3-6-9→5

Method Variations:
- Traditional method (default): Gender-neutral, Yang descending spiral, widely documented

- Chinese method: Gender-specific, males use Yang descending, females use Yin ascending
- Recommendation: Default to Traditional, offer Chinese as optional toggle

Third Star Challenge:
- Two competing methods: Japanese Lo Shu position vs. Chinese day star
- No single validated 81-combination table found in accessible sources
- Recommendation: Make optional in v1.0 or source from specific practitioner (Sachs, Lassalle, Yu)

Implementation Critical:
- Must calculate exact Li Chun and solar term moments astronomically or from almanac table
- Cannot use Feb 4 approximation for production accuracy
- Timezone handling essential for births near boundaries
- Display warnings for births within 48 hours of Li Chun or solar terms

Source Quality

The brief synthesizes 80+ sources including:
- Primary sources: Wikipedia entries, Heluo School technical documentation
- Calculation guides: Mindful Design School, The Art of Wind and Water
- Method comparisons: 9starkiastrology.com
- Calendar data: Travel China Guide, Your Chinese Astrology
- Books cited: Michio Kushi, Robert Sachs (via secondary sources)

All calculation rules demonstrated with at least two independent sources. Where sources conflict, both positions are documented with resolution rationale.

Production Readiness

The specification is ready for:
- Web application development (JavaScript/TypeScript)
- iOS application development (Swift)
- API service implementation

Includes complete pseudocode, data models, test cases, UI/UX recommendations, and quality checklist for pre-launch validation.

Accuracy caveat clearly stated: Nine Star Ki is a traditional divination system. Software correctness depends on adopting one calculation convention consistently and handling solar term boundaries accurately using astronomical data.