**Budget Justification – Tachyon Powered Sub-Space Warp Drive**

1. **Senior Personnel**

Geordi La Forge will serve as the Principal Investigator of the project and will provide extensive design documentation and technical feasibility during the Phase I effort. He will manage the daily aspects of the project, serve as the “gatekeeper” for all the data and reports, and perform all project-related administrative duties. Mr. La Forge will utilize his extensive background in systems engineering and warp core dynamics learned through training at Starfleet Academy and as Chief Engineer aboard the USS Enterprise NCC-1701-D for five seasons. Mr. La Forge will also bring to the project his unique capability of seeing the entire electromagnetic spectrum via the VISOR system, a necessary capability for recognizing gamma fluctuations in an active Warp Drive. Mr. La Forge will dedicate 25 hours a week for a period of 3 months to the Phase I effort, and 15 hours a week for a period of 9 months to the Phase I effort.

Equivalent Salary: [$56.00/hour x (25x13)] + [$56.00/hour x (15x39)] = $50,960

Wesley Crusher will serve as chief crewman during the Phase I effort of the project and will manage all daily reporting and data flows, experimental variables, and research for tachyon-based BSOL (Beyond Speed of Light) systems. Mr. Crusher has extensive knowledge of the daily operational outputs and thrust requirements for the USS Enterprise NCC-1701-D, and will utilize his training at Starfleet Academy with a specialization in engineering to ensure the success of the Phase I effort. Mr. Crusher will dedicate 21 hours a week for the full period of effort on the Phase I project.

Equivalent Salary: [$28.00/hour x (21x52)] = $30,576

Captain Jean-Luc Picard is the captain of the USS Enterprise NCC-1701-D, and is the ultimate owner of the project and the effort, overseeing and approving all changes to the operational framework of the vessel. Mr. Picard is integral to the operation of the vessel and has a deep knowledge and understanding of all operational needs and envelopes of the ship. Under the Phase I effort, Mr. Picard will provide oversight and knowledge, equating to 5 hours a week for the full period of performance.

Equivalent Salary: [$67.00/hour x (5x52)] = $17,420

1. **Other Personnel**

Under the Phase I effort, additional personnel will be necessary to serve as “sacrificial lambs” to overcome and potential plot holes caused by disturbances or industrial accidents during testing and research. These red shirts will be employed during the full period of performance of the project and are vital to maintain full story cohesion. For the Phase I effort, two red shirts will be employed who will provide 20 hours a week of effort each.

Equivalent Salary: [$12.00/hour x (20x52)] x 2 = $24,960

1. **Fringe Benefits**

Due to the New Federation economy put into effect in the 22nd century, no fringe benefits are being collected under this proposed effort, as extra compensation and employee health protection is non-cost bearing. This is a perk of citizenship within the Federation and extends to all Earth born or near Earth born species.

1. **Equipment**

No equipment will be purchased to support this effort.

1. **Travel**

1. As required per the solicitation, two members of the project team will attend the Grantee Conference in Washington DC in order to become familiar with best practices for NSF grants.

Estimated costs for two persons to attend the Grantee Conference in 2018, at Washington DC are as follows:

[PI]: Registration $400; airfare $250; lodging $ 231/night x 3 nights = $693; ground transportation $67.50/day x 4 days = $270; Meals & Incidental Expenses (M&IE) $69/day x 2 full days and 2 half days at $51.75; Total estimate = $1,854.50.

[Other]: Registration $400; airfare $385; lodging $231/night x 3 nights = $693; ground transportation $67.50/day x 4 days = $270; Meals & Incidental Expenses (M&IE) $ 69/day x 2 full days and 2 half days at $51.75; Total estimate = $1,989.50.

Grand total travel #1= $3,844.

During the Phase I activities of this proposal, two additional trips will be taken by core members of the proposal team. Trip 2 will involve travel to the Vulcan Science Academy, where project personnel will network and dialogue with the subawardee on potential project hazards and mitigations over a 3 day period. This trip will be undertaken by Mr. La Forge, Mr. Crusher, and one red shirt. Trip 3 will involve travel to Deep Space 9, a space station located in the Cardassian system. Deep Space 9 is a central hub for trade with the Ferengi populations, a key trade provider who will deliver materials under the Phase I effort. This trip will support establishment of necessary contracts and delivery logistics and supply chains to support transfer of experimental materials. These materials will directly influence the likelihood of success for the technical feasibility of the project. This trip will be undertaken by Mr. La Forge, Cpt. Picard, and one red shirt.

Estimated costs for 3 team members to travel from Earth to VSA to attend a 3- day project team meeting: Transportation $470 pp; lodging $91/night x 3 nights = $273 pp; ground transportation $66.25/day x 4 days = $265; Meals & Incidental Expenses (M&IE) $51/day x 2 full days and $38.25 for 2 travel days = $178.50 pp; Total estimate = $3,029.50.

Estimated costs for 3 team members to travel from Earth to DS9 to attend a 2- day project team meeting: Transportation $680 pp; lodging $91/night x 2 nights = $182 pp; Meals & Incidental Expenses (M&IE) $51/day x 1 full days and $38.25 for 2 travel days = $127.50 pp; Total estimate = $2,968.50.

Grand Total for travel = $9,842.

 **F. Participant Support Costs**

1. No stipends are utilized for this effort.
2. No additional travel is requested for participants.

3. No subsistence cost is requested for this project.

4. No other costs are requested for participants.

**G. Other Direct Costs**

1. Materials and Supplies

Provider: Ferengi Trade Network

Brand: Ferengi Sub-Stand Lines

Model: Dilithium Crystal Array

Quantity: 28

Sub-total: $3980.97 (includes delivery)

Provider: Ferengi Trade Network

Brand: Ferengi Sub-Stand Lines

Model: Anti-matter generation harnesses

Quantity: 2

Sub-total: $456.02 (includes delivery)

Printed materials and supplies on project standing and need will be provide during Trips 2 and 3 to project stakeholders. These printed materials are estimated at a cost of $840.

Grand Total Materials and Supplies= $5,276.99.

2. No publication are requested.

3. During the Phase I effort, warp core engineer specialist Captain Montgomery “Scotty” Scott will be consulted for his expertise and knowledge. Cpt. Scott is a warp core expert and specialist on propulsion of Enterprise class vessels and is an acknowledged and published expert in his field. Cpt. Scott’s services will be leveraged for a period of 200 hours during the Phase I effort, for a not-to-exceed sum of $26,000.

4. No computer services are required for this effort.

5. Under this Phase I effort, a subcontract has been arranged with team member Vulcan Science Academy, who will provide expertise in Tachyon propulsion and sub-space arrangement of particle acceleration. VSA is a recognized institution of merit in warp core technologies and has received multiple endowments for BSOL travel mechanisms. A fixed award of $35,000 will be provided to VSA during the efforts of the Phase I work.

1. **Indirect Costs**

1. G & A is calculated at Starfleet’s normal rate of 7% against the materials and travel base of $15,118.99. The calculated rate includes all necessary management of outside agreements and contracts, executed space for labs, and other cost drivers internal to the business that cannot be directly charged to the project.

2. Overhead is calculated at Starfleet’s usual rate of 35% against the materials and travel base of $15,118.99, and against the management of the subcontracted effort base of $35,000. This rate has been calculated under leveraging all intended project chargeable costs for successful execution and completion of the project.

 **J. Total Direct and Indirect Costs**

Total costs are the sum of total direct costs of $200,034.99 and total indirect costs of $18,599.98, for a grand total of $218,634.97.

 **K. Small Business Fee**

The small business fee requested by Starfleet is 2.8% calculated on the total direct and indirect costs of $218,634.97. The fee is within a normal range for the risk and effort of this project, and is less than the NSF maximum fee of 7%.