1 Introduction and overview

Our mission is to support under-represented groups in STEM[1] fields with a particular focus on STEM professionals of Black/African descent who fare significantly worse in both numbers and growth compared to other under-represented groups. In practice, this support broadly means

- assist STEM professionals who are filtered out of their jobs;
- remove or lower the obstacles that filter out certain groups of STEM fields, especially African Americans who are particularly underrepresented among STEM majors and professionals;
- increase awareness of, and provide greater access to, STEM fields especially among African Americans students.

To understand the solutions the *League Of Independent Scientists And Teachers* (*LOISAT*) is proposing, we turn first to the background story of the founder of *LOISAT* and to the filters that suppress participation in STEM fields at every level of the education pipeline. This is followed by a description of existing strategies to mitigate individual filters, the *LOISAT* plan to coordinate and expand these existing strategies to dissolve the filters and fulfill its mission, and current and future activities. The narrative ends with a detailed description of the *LOISAT* tools and fundraising strategies.

1.1 Before *LOISAT*: background story

Dr. Gary Prézeau, *LOISAT* 's founder and executive director, is a black, research scientist who was laid off in October 2016 after 15 years at Caltech and the Jet Propulsion Laboratory (JPL) for lack of funding. Despite a prediction he made published in *The Astrophysical Journal*[2] about planets being surrounded by dense dark matter hairs, a special feature press release from NASA[3], multiple interviews with the media regarding dark matter hairs[4], and a JPL *Mariner Award* for developing a widely used piece of software for the *Planck Mission*, all of his internal JPL and external NASA grant proposals for a follow-up experiment were rejected. He looked for a new source of income that would provide enough flexibility to pursue his scientific research. He turned to private tutoring.

In parallel to tutoring, Dr. Prézeau continued to develop the theory behind the follow-up experiment as well as discussing it with colleagues. Eventually, he and his wife, Mrs. Kerry Prézeau, decided to fund the experiment themselves at the highly non-trivial cost of $200,000. Having been the only researcher of Black/African descent in the science division at JPL, Dr. Prézeau wanted to conduct the experiment within the context of a non-profit whose mission it is to diversify the STEM fields: *The League Of Independent Scientists And Teachers* was thus born. **The final paper with a non-zero value for the nuclear electric dipole moment of tantalum was made public in 2025.**

1.2 Obstacles to a Diverse STEM Professional Community

The decades-long failure to diversify STEM fields is rooted in obstacles at every educational and professional level that filter out under-represented groups, especially African Americans. Thanks to the

[1] STEM: Science Technology Engineering and Math
[2] G. Prézeau, Astrophys. J. 814 (2015) 2, 122 *Dense Dark Matter Hairs Spreading Out from Earth, Jupiter and Other Compact Bodies*
[3] https://www.nasa.gov/feature/jpl/earth-might-have-hairy-dark-matter
[4] New Scientist: https://www.newscientist.com/article/mg22730332-800-earth-may-have-a-hairy-mane-ofdark-matter-flowing-around-it/
The Blue Dot Report: http://mynspr.org/post/dark-matter-affected-earths-gravity-forms-super-dense-hairs#stream/0
CBS/KCBS Radio in San Francisco: Live radio interview
BBC Earth: http://www.bbc.com/earth/story/20150824-what-is-the-universe-made-of

careful demographic data collected by various institutions, researchers have been able to identify the main filters that systematically remove certain demographics from STEM fields.

1.2.1 The K-12 filter

According to the *NAEP*[5] the 2024 math NAEP score for Black students in 12th grade was 125 compared to 133 for Hispanic students, 157 for White students and 177 for Asian students on a scale of 0-300[6]. In other words, by 12th grade, a large fraction of Black students have been filtered out of careers requiring math proficiency. The *United Negro College Fund* (UNCF) analyzed K-12 disparities and summarized their finding into 9 facts[7]:

1. African American students are less likely than white students to have access to college-ready courses;
2. Even when black students do have access to honors or advanced placement courses, they are vastly underrepresented in these courses[8].
3. African American students are often located in schools with less qualified teachers, teachers with lower salaries and novice teachers.
4. Research has shown evidence of systematic bias in teacher expectations for African American students and non-black teachers were found to have lower expectations of black students than black teachers.
5. There is a clear lack of black representation in school personnel. According to a 2016 Department of Education report, in 2011-12, only 10 percent of public school principals were black, compared to 80 percent white. 82% of public school educators are white, compared to 18 percent teachers of color. In addition, black male teachers only constitute two percent of the teaching workforce.
6. African American students are less likely to be college-ready. In fact, 61 percent of ACT-tested black students in the 2015 high school graduating class met none of the four ACT college readiness benchmarks, nearly twice the 31 percent rate for all students.
7. Black students spend less time in the classroom due to discipline, which further hinders their access to a quality education.
8. Students of color are often concentrated in schools with fewer resources.
9. According to the Office for Civil Rights, 1.6 million students attend a school with a sworn law enforcement officer (SLEO), but not a school counselor.

1.2.2 The college filter

College further filters out the already reduced number of Black students who choose a STEM field as a major. The numbers of Bachelor degrees in Physics and Math/Stats have dropped by approximately 50% since 1998 according to American Physical Society[9] which is correlated with a consistent downward trend in Engineering as readily observed in Fig. 1. To complete this bleak STEM picture for Black students, Computational Science has been on a downward trend since 2004. According to a 2019 article by Riegel-Crumb *et al* published in *Educational Researcher*[10], federal data from the *National Center of Education Statistics* shows evidence for "persistent racial/ethnic inequality in STEM degree attainment not found in other fields" where 40% of Black STEM students switch majors before earning a degree with an additional 26% of Black students simply dropping out of college. In an interview with *EAB*[11], lead author Catherine Riegle-Crumb suggests two main reasons for this filtering out of Black STEM students:

[5]The National Assessment of Educational Progress, aka "The Nation's Report Card".
[6]https://www.nationsreportcard.gov/mathematics/nation/groups/?grade=12
[7]For more details, see https://uncf.org/pages/k-12-disparity-facts-and-stats
[8]See also the January 2020 *Education Trust* report https://edtrust.org/resource/inequities-in-advanced-coursework/
[9]For more details, see https://www.aps.org/programs/education/statistics/aamajors.cfm
[10]See https://journals.sagepub.com/doi/full/10.3102/0013189X19831006?journalCode=edra
[11]https://eab.com/insights/daily-briefing/student-success/a-third-of-minority-students-leave-stem-majors-heres-why/

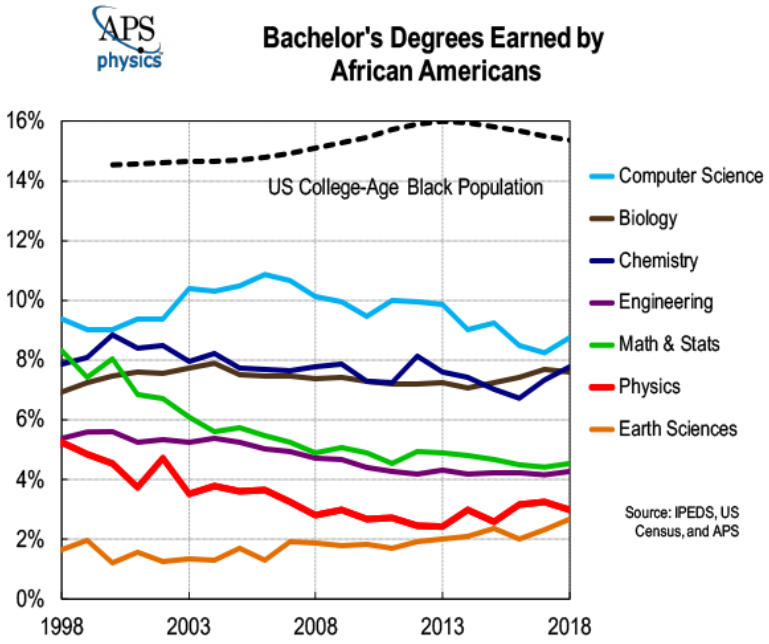

Figure 1: Longitudinal trends of Bachelor Degrees in STEM fields earned by African Americans. The black hyphenated line at the top of the graph represents the percentage of Americans identifying as Black.

- Black students are more likely to come from low-income families and do not have access to the same resources that support most college students;
- discrimination, bias and social environment push students out STEM majors.

1.2.3 The assistant professor filter

A 2014 study[12] by the *American Institute of Physics* on the number of African American, Hispanic and Asian physics faculty found significantly increased representation of Hispanic and Asian physics professors from 2004-2012 in contrast to a percentage of African American physics faculty effectively stuck at 2% (see Fig. 2) compared to the 13% of Americans who identify as African Americans. Another 2017 study by Li and Kodel published in the *Educational Researcher*[13] [14] analyses 2015-2016 faculty data from the top 40 public universities as ranked by 2016 *U.S. News & World Report* across 3 STEM fields (biology, chemistry, economics) and 3 non-STEM fields (educational leadership and policy, English, and sociology). They found that relative to the Black PhD production rates, **"Black faculty is consistently underrepresented as assistant professors in STEM fields at the selective universities"** they studied. Alternatively, they also found that they **"are overrepresented among assistant professors relative to their PhD production rates in all three non-STEM fields (albeit only marginally in educational leadership and policy)."**

In contrast, relative to their PhD production rates, Hispanic Americans and Women are not particularly over-represented or underrepresented among assistant professors (see Fig. 3). Since African American PhD's are uniquely under-represented among assistant professors in STEM fields relative to PhD production rates, a filter specific to STEM fields either discourages AfricanAmerican PhD's to pursue academic careers or selects them out.

[12] See https://www.aip.org/statistics/reports/african-americans-hispanics-among-physics-astronomy-faculty-o
[13] https://journals.sagepub.com/doi/abs/10.3102/0013189X17726535?journalCode=edra
[14] https://www.pewresearch.org/fact-tank/2019/07/31/us-college-faculty-student-diversity/

Table 1

Race and Ethnicity of Physics Faculty

	Physics			All Disciplines*
	2004 (%)	2008 (%)	2012 (%)	2009 (%)
African-American	2.0	2.2	2.1	6.6
Asian	10.6	13.2	14.3	6.0
Hispanic	2.7	3.1	3.2	4.0
White	82.2	80.0	79.2	74.9
Other	2.2	1.5	1.2	0.5

* Data for all disciplines (which includes non-science disciplines) found at http://nces.ed.gov/fastfacts/display.asp?id=61

www.aip.org/statistics

Figure 2: Physics faculty by race and ethnicity from 2004-2012.

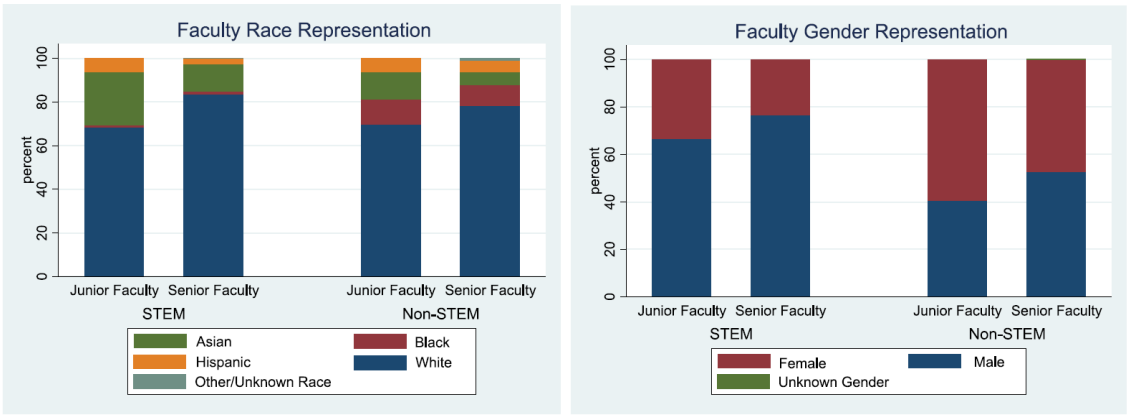

Figure 3: Faculty in STEM and non-STEM fields by gender and race/ethnicity. African American STEM assistant/junior professors are the only under-represented group relative to their PhD production rates.

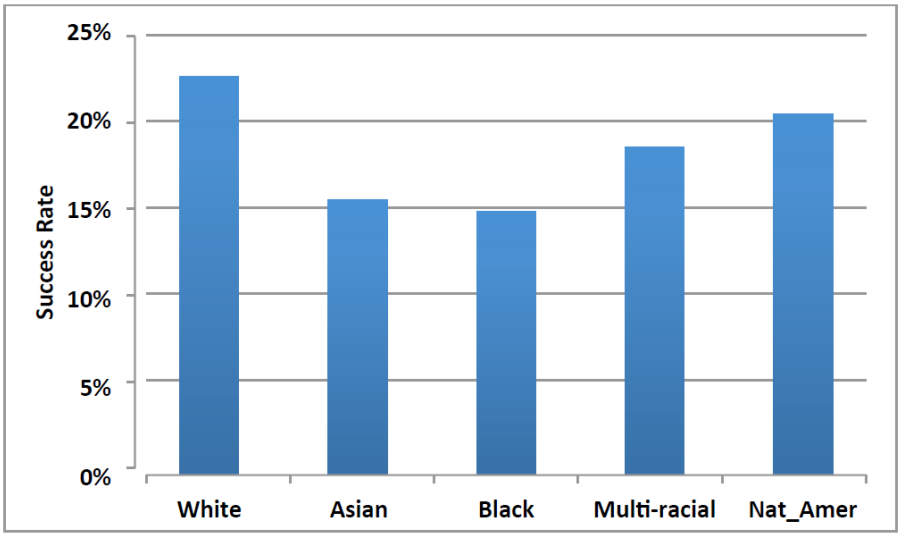

Figure 4: FY 2016 Success Rates for Externally Reviewed Research Proposals, by PI Race.

1.2.4 The funding filter

For the small percentage of African American PhD's who have passed through all the earlier filters and obtained a professorship in a STEM field, they still must get grants if they wish to obtain tenure and be able to fund their research and hire postdoctoral fellows. However, African American researchers have been statistically less successful at obtaining grants from the main grant-making institutions. For example, 2016 NSF grant data[15] show that only 2% of research proposals were submitted by Black scientists (83% of all NSF proposals were research proposals) in contrast to 4% for Hispanic American researchers, 25% for Asian American researchers and 59% for White Americans. Evidence of a funding filter becomes salient when success rates are considered: research proposals submitted by African American scientists had the lowest success rate of any group at 18% in contrast to the success rate of 24% for proposals submitted by White researchers. When considering all externally reviewed proposals (95% of all NSF proposals), the success rate for African American scientists falls below 15% (see the bar plot in Fig. 4[16]). Some funding agencies do not make any of demographic data available to the public. For example, in response to the following question by Dr. Prézeau,

Dear SARA team, Can you provide the success rate of ROSES or any other NASA calls by the race of the PI? I am unable to find this data on your website or anywhere else. Anything you can provide will be welcome, but historical data (say for the last 20 years) would be the most useful.

NASA's *Senior Advisor for Research and Analysis* nicknamed *SARA* replied

Dr. Prézeau, This is a super interesting question. Sadly, I don't have that data. Relatively recently (like in the past couple/few years) NASA started asking (but not requiring) prospective PIs to provide some demographic data but I don't have access to it. Only the office of the chief scientist (OCS) has access to that data. I personally have seen a presentation by someone from OCS on success rates for male vs. female PIs proposing to ROSES (the win rates are the same), but have not seen this data for black vs. white PIs, for example. My understanding is that the proportion of proposers who identify themselves as other than white is not large relative to the number who choose not to answer the question at all so, given the uncertainties, no firm conclusions could be drawn.

[15] https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsb201726
[16] Fig. 4 is Table 4.3 of the NSF 2016 report.

1.3 Existing 501(c)(3) and government agencies programs that mitigate the filters

The existence of the filters described in section 1.2.1 is largely due to a lack of access to high quality educational materials, exposure to teachers that may hold biases and be less qualified, lack of college readiness by graduation, and the affordability of support while in college. These filters are mitigated by the existence of free, high quality educational material; annual, prestigious high school competitions promoting STEM majors; donations to *College Savings Accounts* (CSA's); STEM fellowships for college-bound underrepresented groups.

Access to free educational material and competitions has been used to promote STEM fields:

- **Access to free educational material:** Perhaps the best example of a 501(c)(3) that provides free access to high quality educational material is the *Khan Academy* which receives approximately 5 million unique visitors per month. Its STEM content is comprehensive and well presented. *Khan Academy*'s content is rooted in its library of 1000's of videos hosted by YouTube, and supported by its website which has the following features to improve learning and retention:
    1. practice exercises;
    2. hints and other teaching tools;
    3. tracking of progress and student behavior to create individual profiles of students;
    4. tracking of effectiveness of hints, videos and other tools to customize and improve the learning experience.
- **Competitions:** A number of 501(c)(3)'s promote STEM fields through prestigious contests such as the *American Association of Physics Teachers' F=ma*, which selects the US Physics Team for the International Physics Olympiad, and the *Mathematical Association of America* which sponsors the competition that selects the US team that attends the International Math Olympiads. These competitions hold a lot of currency in college applications as winners of these competitions often end up attending America's top science and engineering universities. These universities also tend to produce the majority of STEM faculty[17]. Prestigious competitions always draw attention, but these STEM competitions attract few students generally. For example, only 6000 students took the *F=ma* first round test with only 400 invited for the second round test; as for the United States Math Olympiad, it is restricted to 500 participants. Participating in these competitions truly rewards only the 20 students or so who make it on the US team and are effectively Ivy League-bound. These competitions have no impact on the remaining 4 million high school seniors in the United States.
- **Competitions in chess non-profits:** Although chess is not a STEM field, there is much to learn about how chess is promoted to the public by lovers of the game. *Lichess* is a French non-profit foundation with 5 million members where any player can compete with any other, or against the computer, in individual games, tournaments, or puzzles. The features include
    1. every player gets a rating for each type of games s/he play (slow, fast or puzzles for example);
    2. the software matches players with similar ratings;
    3. players who are not ready to compete against other players can do puzzle storms where the player solves as many puzzles as possible in three minutes. The puzzles become harder as the player's puzzle rating improves.

When it comes to financial assistance, donations to CSA's are a popular vehicle to assist students who can't afford to pay for college. Indeed, data suggests that even relatively small amounts in CSA's hugely increase the likelihood of a K-12 student attending and completing college. One 2013 study published by Elliott *et al* in *Children and Youth Services Review*[18] showed that

[17] https://advances.sciencemag.org/content/1/1/e1400005

[18] *Small-dollar children's savings accounts and children's college outcomes by income level* https://www.ncan.org/page/Savings https://www.sciencedirect.com/science/article/abs/pii/S0190740912004379

"A low- and moderate-income (<$50,000) child who has school savings of $1 to $499 prior to reaching college age is over three times more likely to enroll in college and four times more likely to graduate from college than a child with no savings account.".

Incentives to open CSA's come from both governments and 501(c)(3)'s:

- **Government incentives:** State programs provide incentives through tax breaks, seed money, matching contributions or through partnerships with non-profit organizations. *The Virginia529 plan* in particular partners with several nonprofit organizations to make CSA contributions to low-income high school students as they pass educational milestones. Students can earn up to $2,000 if they maintain a 2.5 GPA and other conditions.
- **501(c)(3) programs:** Non-profits provide funds to students who complete college-access milestones through matching donations up to a predetermined maximum and/or seed money. Seed money from *Promise Programs* is sometimes deposited at Birth; *Oakland Promise* has a *Brilliant Baby* savings account where $500 is deposited at birth.

STEM fellowships available to African American college-bound students include[19]:

- ACS Scholars Program: $5,000;
- African American Network of the Carolinas : amount varies for college;
- AMS Minority Scholarships: $6,000;
- Fontana Transport Inc. Scholars Program: $5,000;
- EPP Undergraduate Scholarship Program: $45,000 for majoring in atmospheric, oceanic, or environmental discipline in a minority serving institution.

The biggest provider of college scholarships to African American students is the UNCF but they have few if any scholarships specific to majoring in a STEM field in college[20].

1.4 The *LOISAT* Plan

1.4.1 K-12 plan

The *LOISAT* Plan for K-12 is to improve, expand, and coordinate all existing strategies to provide millions of students with a solid foundation in STEM fields. This will lead to a large increase of underrepresented groups that have both the desire, and a confidence rooted in competence, to major in STEM fields. The main elements of the plan include:

- Build the *Teach Learn Platform* (see details in section 2.1) that combines the learning strategies of the *Khan Academy* and *Lichess* with the incentives of a *College Savings Account* to attend and complete college. In practice, this means
    1. a teaching software with learning videos, explanations and examples, capable of designing unique STEM puzzles and solution hints that fit the student profile; it will also be able to host *Brain Rush*es and *Brain Battles* (see section 2.1.1) with other students with a similar STEM rating who are in the same grade, the same school, the same school district, the same zip code, etc;

[19]https://www.scholarships.com/financial-aid/college-scholarships/scholarships-by-type/minority-scholarships/african-american-scholarships/

[20]https://scholarships.uncf.org/?_ga=2.210817621.1937025442.1611951142-1831316183.1611626961

2. a *LOISAT* CSA where stipends can be deposited. The value of that stipend is pegged to the STEM rating of the student[21] and the passing of grade-specific academic benchmarks on the *Teach Learn Platform* under proctored conditions. It's important to note that the stipends will be available to the student immediately and that students can go back to earlier grades, pass the benchmarks for that grade and receive the corresponding stipends.
3. public recognition of individual student achievement. The intrinsic educational value of knowing things like the multiplication table so well that you can solve 100 multiplication questions in 5 minutes will be recognized whether or not a particular student is the fastest in his or her cohort. Recognition will take many forms like a student's name appearing on a digital wall of achievers or in the *LOISAT* e-newsletter *Knowledge and Life* (see section 2.4), to the awarding of certificates all the way up to being featured in the annual *LOISAT* gala (see section 3.3).

- free tutoring for low-income students who are either lagging behind despite using the *Teach Learn Platform*;
- free, advanced tutoring for low-income students, especially African American students, who are particularly gifted in STEM fields;

1.4.2 Support for STEM college majors

A large influx of underrepresented students in STEM majors following the dissolution of K-12 filters should alleviate feelings of social isolation that many, especially Black STEM majors may feel. This will be doubly true if the number of Black professors also increases.

To further improve the odds that STEM majors do not leave their majors or drop out of college, two reinforcing strategies are applied: *Teaching by learning* also known as the *Protégé Effect* and increased financial security through teaching grants.

The *Protégé Effect* has been shown to be effective in deeper learning and better retention for the teacher[22] while simultaneously providing benefits to the student being taught[23]. One possible reason is that preparing for a lesson and actually teaching the lesson requires a deeper review of the material leading to a deeper understanding. STEM majors who participate in the *LOISAT* program to teach K-12 students or peers would not only help other students succeed, gain deeper understanding of the material, but would be financially rewarded through *LOISAT* stipends.

A virtuous cycle of increased financial resources, sharpened teaching skills and greater subject mastery of STEM fields would lead to greater odds of the college student completing the STEM major.

1.4.3 Teaching, Research and financial freedom grants for STEM professionals

The steps to dissolve the K-12 and college major filters should greatly help break the filter that leads to a severe dearth of Black STEM assistant professors and other STEM professionals. For underrepresented STEM professionals no longer in school, *LOISAT* will provide support in the form of

- research grants;
- teaching grants;

[21] Note that the value of the stipend can never decrease.
[22] https://www.sciencedirect.com/science/article/abs/pii/S0361476X13000209
[23] https://journals.sagepub.com/doi/abs/10.3102/00028312019002237

2 *LOISAT* current and future activities

It has been five years since *LOISAT* was founded, and the experiment to detect the first non-zero subatomic electric dipole moment was successfully completed with the paper now publicly available. Publishing and advertising the experimental results under the *LOISAT* banner shows our commitment to the *LOISAT* mission, demonstrates our seriousness of purpose, and makes a convincing argument that *LOISAT* is a non-profit worth donating to. We are currently in the middle of our first national fundraising campaigns to fulfill our mission at both the K-12 level and at the college/professional levels: our first campaign, called *Shields and Spears* aims to fund the building of the K-12 *Teach Learn Platform* and fund the stipends for students and the tutoring community of peers; the second campaign called *Detecting the dark matter axion wind* aims to collaborate with institutions that have a strong record at retaining and graduating Black physics students, and provide research opportunities in the search for dark matter to Black professionals.

Our future activities ordered in terms of our priority are

1. build the *Teach Learn Platform*;
2. host the first *Knowledge and Life* lecture series;
3. Build the *Team Building Board*;
4. publish the first e-newsletter *Knowledge and Life*.

2.1 *Teach Learn Platform*

LOISAT will provide a *Teach Learn Platform* where partners can give their *Knowledge and Life* lecture series and answer questions from individual members. Partners will have their individual website on the *Teach Learn Platform* where their research and academic background are displayed plus any free academic content they choose to include. By and large, partners will control the content of their website as long as it conforms to the *LOISAT* ethical standards and rules. The general public will have access to all free educational material on partner websites.

The *Teach Learn Platform* desktop and mobile versions will have the following features:

- a *Review and Learn* feature that creates randomized exercises based on a template written by a partner teaching a *Knowledge and Life* lecture series. The template will contain variables that can be randomized (such as the numerical value of a mean in a statistical exercise) to create exercises with unique numerical answers or formulas;
- Hints for solving exercises written in by the partner;
- a 'retry an exercise' function that creates an identical problem with different values;
- a *Stats and Trend* function that tracks improvement over time in the percentage of correct answers and builds an individual student profile;
- a daily exercise or question function;
- a benchmark STEM rating that increases with every benchmark achievement and can never decrease;
- a stipend tracker that displays the total amount that can still be earned by the student. The stipend tracker will also provide mandatory lessons on financial responsibility and planning.
- reminders about learning steps remaining to cross the next milestone and increase the benchmark STEM rating;
- timed *Brain Rushes* to practice solving problems or answering questions in a specific subject as fast as possible (see section 2.1.1);

- timed *Brain Battles* to compete at solving the same set of problems or answering questions in any subject against other students and members (see section 2.1.1);
- a messaging function to contact partners and other members moderated to ensure adherence to *LOISAT* ethical standards;

2.1.1 *Brain Rush* and *Brain Battle* competitions for K-12 students and adults

Knowledge and problem-solving competitions will be sponsored by *LOISAT* called *Brain Battles* with the following features:

- children will only be able to compete against other children, and adults with other adults;
- a *Brain Battle* rating will increase or decrease depending on the results of *Brain Battle*;
- participants will be randomly paired with other members of similar *Brain Battle* rating;
- participants can also choose to *Brain Battle* with friends;
- tournaments will be organized by either grade or school level, children participating in *Brain Battles* will compete against other students in their school, school district, zip code, city, county, state, and from other states. Depending on the size of a tournament, winners of these battles will receive certificates, trophies or plaques engraved with their names; their names will also appear in the next issue of the *Knowledge and Life* e-newsletter. The highest level winners will also be invited to the *LOISAT* gala and be the subject of a feature story in the *Knowledge and Life* e-newsletter. *LOISAT* will collaborate with school officials at all levels to provide free teaching assistance to students who participate in *Brain Battles* and attend schools where at least 80% of the children benefit from the *National School Lunch Program*.
- To encourage a culture of lifelong learning, regional and national *Brain Battles* competitions for non-specialist adults will also be organized by *LOISAT* in advanced topics. Winners of these *Brain Battles* will receive plaques and trophies and be the subject of feature stories in the *Knowledge and Life* e-newsletter.

In order to practice for a *Brain Battle*, a *Brain Rush* option will be available for students who wish to compete against the clock. A *Brain Rush* will consist of a fixed time during which as many problems in a topic need to be solved. The *Brain Rush* will keep track of all the stats (problem success rate per topic and trends) of the member.

2.2 *Knowledge and Life* lecture series

To give its partners the support they need to keep their research and teaching skills sharp, *LOISAT* will provide grants to partners who wish to create a lecture series on a specific subject. The partner will

- choose the number of lectures in his or her series;
- draw up a summary of the content of each lecture;
- choose whether to include problem sets by activating the *Review and Learn* (see section 2.1),
- and the date and time of each lecture.

The *Knowledge and Life* series will fall into the following category based on its depth:

- *Master Series*: three to five 1-hour lectures and the *Review and Learn* is off;

- *Grand Master Series*: six to ten 1-hour lectures and the *Review and Learn* is on;
- *Magnus Series*: More than ten 1-hour lectures and the *Review and Learn* is on.

After achieving a pre-determined success rate in the *Review and Learn*, the member will receive a *LOISAT* certificate of completion in the *Grand Master* and *Magnus Series*. *LOISAT* will advertise all series on its *Knowledge and Life* lecture series website, in its *Knowledge and Life* e-newsletter, and in an e-blast to its partners and members (see section 3.2).

2.3 *Team Building Board*

LOISAT will facilitate contact between partners through a *Team Building Board* platform where

- research/teaching questions are posed to the *LOISAT* community of partners,
- where offers for collaboration on topics are described and broadcast,
- and discussions can occur either through a message board or a video feed.

LOISAT understands that not all partners will be interested in all discussion topics; filters will therefore be included in the *Team Building Board* that reflect the topical preferences of individual partners.

2.4 **e-newsletter** *Knowledge and Life*

To further the goal of building of a *LOISAT* community of partners and members, *LOISAT* will publish a regular electronic newsletter also called *Knowledge and Life* that will contain

- In depth articles written by partners for the non-specialist on their main field of interest;
- feature profiles of extraordinary partners and their accomplishments;
- feature profiles of members who have shown their strong support of *LOISAT* through donations and deeds;
- feature profiles of students and adult members because of an extraordinary achievement;
- a calendar of *LOISAT* events, job openings and grant deadlines.

3 Fundraising Strategies

3.1 First national fundraising campaign

What will help make the *LOISAT* plan convincing to donors is the fact that its basic elements (for example, CSA's and access to free, high quality STEM material) are already broadly supported by non-profits, corporations and government agencies.

Despite the many qualities of other non-profits focused on education, the issue of diversity is as acute (or worse) as it has ever been. To truly reach and develop the untapped potential of the tens of millions of Americans filtered out of STEM fields requires a coordinated plan such as the *LOISAT* plan summarized by

- a massive expansion of CSA's;

- a massive expansion of teaching assistance in STEM fields to underrepresented groups that also takes advantage of the *Protégé effect* that benefit of College Students;
- a system of reward and recognition that doesn't depend winning national competitions but rather depends on personal or local achievements instantaneously visible in the improvement of the STEM rating and increased CSA value;
- support of increased diversity at all STEM levels including STEM professionals.

3.2 Memberships

The *LOISAT* membership structure is inspired in part by a very successful 501(c)(3): *Huntington Library, Art Museum, and Botanical Gardens* (EIN 95-1644589). *Huntington* members have access to exhibitions, lecture series, classes, private tours and discussions, and galas. In addition, *Huntington* also hosts researchers who perform ground breaking work. Like *Huntington*, *LOISAT* will offer varying levels of memberships:

- *Basic* membership:
    1. fee: $0 to $9. Signing up by creating an account is sufficient.
    2. subscription to *Knowledge and Life*;
    3. download of the *Teach Learn Platform* with access to unlocked features;
    4. access to any member website including the free content;
- *Sustaining* membership:
    1. fee: $10 to $99;
    2. everything in the *Basic* membership;
    3. all features in the *Teach Learn Platform* now unlocked;
- *Contributor* membership:
    1. fee: $100;
    2. everything in the *Sustaining* membership;
    3. 1-hour private question and answer teaching session with one partner of the member's choice depending on availability or
    4. participation in one free *Knowledge and Life Master* lecture series of the member's choice;
    5. each additional donation of $100 up to $400 adds an extra hour of private question and answer teaching session with one partner or one additional free *Knowledge and Life Master* lecture series.
- *Affiliate* membership:
    1. donation: $500
    2. everything in the *Sustaining* membership;
    3. invitation to one *Grand Master* lecture series of the member's choice;
- *Supporting* membership:
    1. donation: $1000
    2. everything in the *Affiliate* membership;
    3. access to up to 11 hours of private question and answer sessions with members;
    4. invitation to one *Magnus* lecture series of the member's choice;
- *Patron* membership:
    1. donation: $10,000

2. everything in the *Supporting* membership;
3. invitation to all *Grand Master* lecture series;
4. invitation to up to 11 *Magnus* lecture series;
5. access to up to 110 hours of private question and answer sessions with members;
6. one free *Affiliate* membership to give to a friend;
7. invitation to the *LOISAT* gala;

- *Benefactor* membership:

1. donation: $100,000 or more;
2. lifelong membership in *LOISAT* with free participation in any *Knowledge and Life* lecture series;
3. private question and answer sessions with any partner depending on availability;
4. invitation to address the *LOISAT* Board of Directors;
5. feature story in the *Knowledge and Life* e-newsletter;
6. receipt of plaque at the *LOISAT* gala;
7. recognition in the *LOISAT* annual report;
8. two free *Affiliate* memberships to give to friends;

3.3 Gala

The *LOISAT* Gala will primarily feature extraordinary partners, donors, and members. We will also invite distinguished speakers to give talks on topics of broad interest, as well as who believe in the *LOISAT* mission and are willing donate performances. It will be a fundraising event with tickets for sale. We aim for the Gala to garner media attention that will underpin our annual fundraising drive.

4 Distribution to Other Organizations and Individuals

We do not fundraise for any specific organization and *LOISAT* is not organized solely to contribute or raise funds for any specific entity. However, at the discretion of the board of directors we may at times, choose to contribute to other organizations who share a similar mission and only if the contributions further our exempt status.

LOISAT may exercise its right under law to contribute to non 501(c)(3) organizations only on the condition that *LOISAT* retains control over the use of the funds and maintaining records showing that the funds are used for exclusively charitable purposes in accordance to our mission.