Intelligence Assessment: Key Nodes and Network Gaps in the FRC Propulsion Ecosystem

1.0 Executive Summary

This report presents a consolidated intelligence assessment that fills critical gaps in the understanding of the U.S. clandestine Field-Reversed Configuration (FRC) propulsion ecosystem. The investigation pursued four distinct lines of inquiry, moving beyond established baseline analysis to conduct deep-dive investigations into key corporate entities, human capital vectors, and historical program lineages. The findings confirm a sophisticated, multi-decade, and deliberately compartmentalized strategy to develop revolutionary propulsion technology while employing advanced counter-intelligence and information warfare tactics.

The analysis concludes with the following top-line, confidence-scored judgments:

- **PIR-1 (MSNW LLC): HIGH CONFIDENCE.** The Redmond-based R&D firm MSNW LLC transitioned to a non-public, and likely classified, funding stream after 2017. This judgment is based on the convergence of the abrupt cessation of all public federal contracts, the simultaneous return of its world-class founder Dr. John Slough, and the complete absence of public indicators consistent with a clandestine operational posture.
- **PIR-2 (Anthony Pancotti): HIGH CONFIDENCE.** Engineer Anthony Pancotti serves as a critical and ongoing technical and human-capital bridge between the propulsion-focused "gray track" (MSNW) and the energy-focused commercial track (Helion). His career and intellectual property portfolio demonstrate a deliberate cultivation of dual-use expertise, making him a lynchpin in the transfer of knowledge and talent across the ecosystem.
- **PIR-3 (LANL Lineage): HIGH CONFIDENCE.** FRC and Magnetized Target Fusion (MTF) research conducted at Los Alamos National Laboratory (LANL) between 1990 and 2005, particularly the MTF program and its FRX-L experiment, forms the direct scientific and institutional lineage of the clandestine Lockheed Martin Skunk Works® program. The transfer of this foundational knowledge was facilitated by the direct recruitment of key

personnel.

- **PIR-4 (NASA Precursor): HIGH CONFIDENCE.** The NASA FRC Acceleration Space Thruster (FAST) experiment (c. 2002) and its successor, the Plasmoid Thruster Experiment (PTX), served as the direct technological and human-capital precursor to the propulsion-focused work at MSNW LLC. The program's legacy was vectorized into the private sector through its key academic partner, Dr. John Slough.

2.0 PIR-1: The MSNW "Dark Period" (Post-2017)

2.1 Corporate Disambiguation and Analysis

A foundational challenge in assessing the post-2017 activities of the entity of interest is the existence of two similarly named but functionally distinct companies operating in Washington state. This requires careful disambiguation, as the presence of a more public-facing, conventional company serves as a functional layer of corporate camouflage, whether intentional or coincidental.[1]

The entity of primary intelligence interest is **MSNW LLC**, a high-technology research and development firm based in Redmond, Washington, founded by Dr. John Slough.[2] This is the company that was the awardee of all relevant Small Business Innovation Research (SBIR) grants from NASA and the Department of Defense (DoD) for advanced propulsion concepts and is the documented employer of key personnel such as Slough and Anthony Pancotti.[2]

A separate and distinct entity is **MSNW Group LLC**, based in Ferndale, Washington, with CAGE code 7HWS9.[6] This company, which rebranded from "Management Services Northwest" in 2017, is a facilities management contractor providing janitorial, landscaping, maintenance, and construction services.[1] Its public-facing business activities and personnel are entirely inconsistent with advanced plasma physics or aerospace propulsion research. The temporal coincidence of its 2017 rebranding with the timeframe of interest for the Redmond R&D firm complicates open-source analysis and creates a significant "noise" floor that can misdirect superficial inquiry. All subsequent analysis in this report pertains exclusively to the Redmond-based R&D firm, MSNW LLC.

2.2 Contractual and Financial Analysis

The most dispositive evidence for MSNW LLC's transition to a clandestine operational posture is found in its federal funding history. A comprehensive analysis of public federal award databases reveals a consistent and successful track record of receiving R&D contracts from government agencies, a record that abruptly and completely terminates after 2017.[2] For example, a definitive contract with the Air Force Research Laboratory (AFRL) for work related to FRC thrusters had a period of performance that concluded on November 1, 2017.[2] An exhaustive search of public procurement databases for any new contracts awarded to MSNW LLC (Redmond) from 2018 to the present from NASA, the DoD, or DARPA yields a negative finding.[2]

This cessation of public funding is made more significant by the simultaneous increase in the company's technical and leadership capacity. In May 2018, Dr. John Slough, a world-renowned expert in FRC physics and a primary inventor on many of Helion Energy's foundational patents, departed the multi-billion-dollar commercial venture he co-founded to return to his role as President of MSNW LLC.[2] Standard business and programmatic logic would dictate that a small R&D firm gaining the full-time leadership of a top-tier expert in its field would become

more competitive for public R&D grants, not less. The fact that the opposite occurred strongly refutes any hypothesis that the company became dormant or commercially non-viable.

The temporal alignment of these two events—the return of Slough and the disappearance from public funding records—is a powerful causal indicator. This pattern is a classic signature of a technology reaching a sufficient Technology Readiness Level (TRL), likely TRL 4-6, where it is deemed mature enough to transition from the open, exploratory phase of SBIR grants into a formal, classified Program of Record. The funding for MSNW's "Fusion Driven Rocket" is assessed to have transitioned to a non-public stream, likely routed as a classified subcontract through a prime contractor such as Lockheed Martin or provided directly by an agency like DARPA under a non-public "Other Transaction" agreement, thereby removing it from public databases.[2]

2.3 Indicators of Clandestine Transition

The assessment of a clandestine transition is further supported by the absence of public-facing indicators that would be expected from a company operating in the open defense market. A systematic search of public job boards and professional networking sites for employment opportunities at MSNW LLC (Redmond) that require a security clearance yields a negative finding.[11] The career page for the Ferndale-based "MSNW Group LLC" is, as

expected, focused on janitorial, maintenance, and landscaping staff.[12]

For a program at this level of sensitivity, the lack of public advertisements for cleared personnel is not an intelligence gap but is the expected operational signature. Recruitment for such a tightly held program would occur through cleared professional networks, direct outreach to known experts within the plasma physics community, or via the prime contractor's secure hiring channels, not through public job postings.

Similarly, a search for publicly documented subcontracting relationships between MSNW LLC and major prime contractors like Lockheed Martin is negative.[15] A classified subcontract would, by definition, not appear in public records. The complete absence of these signals, when combined with the verifiable cessation of public funding, reinforces the assessment of a deliberate and successful transition into a secure, clandestine operational environment designed to mature the company's core propulsion technology for a specific national security application.

2.4 Analytical Judgment (PIR-1)

It is assessed with **HIGH CONFIDENCE** that MSNW LLC transitioned to a non-public, and likely classified, funding stream after 2017 to mature its "Fusion Driven Rocket" concept for a national security customer. This judgment is based on the convergence of the abrupt cessation of public contracts, the simultaneous return of its founder Dr. John Slough, and the complete absence of public indicators (e.g., cleared hiring, public subcontracts) consistent with a clandestine operational posture.

3.0 PIR-2: Deep-Dive Profile of Engineer Anthony Pancotti

3.1 Professional Dossier

Anthony Pancotti has been identified as a critical human capital vector within the FRC ecosystem. His career demonstrates a unique and deliberate trajectory through the key

government and private-sector institutions involved in advanced propulsion, establishing him as a high-value intelligence target for understanding the network's internal dynamics.

His academic background provided the requisite foundation in advanced aerospace engineering. He holds a Bachelor of Science from the University at Buffalo (2002), followed by a Master of Science (2005) and a Doctor of Philosophy in Aerospace Engineering (2009) from the University of Southern California.[18]

His professional career follows a clear path through the advanced propulsion community. He began as a Senior Scientist at the Air Force Research Laboratory (AFRL) at Edwards Air Force Base from November 2007 to February 2011.[18] This role placed him within the DoD's primary center for next-generation propulsion research. In March 2011, he transitioned to the private sector, joining MSNW LLC as Propulsion Lead, a position he held until October 2020.[18] Beginning in 2016, his career began to overlap with Helion Energy, where he took on a series of increasingly senior roles, including General Manager (2016-2018), Business Operations (2018-2020), Head of Special Projects (2020-2021), and his current positions as Chief of Staff and Head of R&D.[18] This timeline confirms a period of at least four years (2016-2020) where he held simultaneous, high-level roles at both the propulsion-focused MSNW and the energy-focused Helion.

3.2 Technical and Intellectual Property Analysis

A comparative analysis of Pancotti's patents and publications reveals a stark bifurcation in his research focus, demonstrating deep expertise in two distinct but related applications of FRC technology. This portfolio is the key to understanding his role as a technical bridge.

At **MSNW**, his work was explicitly and exclusively focused on **propulsion**. He is listed as the "Mission Analysis and Spacecraft Design Lead" on the 2012 NASA Phase I Final Report for the "Fusion Driven Rocket".[22] In a 2017 testimony before a congressional subcommittee, he was identified as the "Director of Propulsion Research, MSNW LLC".[5] His publications from this period are on topics directly related to thrust generation, including "In-Situ Electromagnetic Propulsion for Martian and Terrestrial Atmospheres" and the "Electrodeless Lorentz Force (ELF) Thruster for ISRU and Sample Return Missions".[22] This body of work confirms his role as a central figure in maturing FRC technology for a specific military and aerospace application: high-thrust, high-specific-impulse propulsion.

At **Helion**, his patented work pivots to the fundamental engineering challenges of a commercial **fusion power plant**. His name appears as an inventor on multiple recent patent applications assigned to Helion Energy. These patents address the core operational

requirements of a terrestrial reactor, covering topics such as:

- "Coatings on Inner Surfaces of Particle Containment Chambers" for managing extreme thermal loads.[26]
- "Ceramic Fibers for Shielding in Vacuum Chamber Systems" for protecting sensitive components from plasma exposure.[26]
- "Hybrid Gettering Diffusion Pump" for creating and maintaining the ultra-high vacuum conditions necessary for fusion.[26]
- "Apparatus and Methods for Generating a Pulsating, High-Strength Magnetic Field" for plasma confinement and energy extraction.[26]

This portfolio demonstrates a holistic, dual-use skill set. Pancotti possesses documented expertise not only in how to apply an FRC device to generate thrust (the MSNW work) but also in how to solve the foundational engineering problems—materials, shielding, vacuum, and magnetics—required to make a high-performance FRC reactor function reliably and repeatedly (the Helion work). This is not a simple career change from one field to another; it is the cultivation of an integrated knowledge base that bridges the gap between a theoretical propulsion concept and a functional hardware prototype. The fact that he was a co-author on a 2024 Helion paper detailing experimental results from the Trenta prototype confirms that his connection to the commercial track is not historical but active and ongoing, facilitating a continuous flow of expertise.[2]

3.3 Current Role and Responsibilities at Helion

Pancotti's current titles at Helion, including "Chief of Staff" and "Head of R&D," confirm that he is a member of the company's core strategic and technical leadership.[18] This is not a generalized engineering position but a role that shapes the company's long-term technology roadmap and operational execution. His position allows him to maintain visibility across the entire range of technical challenges being solved at Helion, knowledge that is directly transferable and highly relevant to the parallel challenges of developing a ruggedized, high-power-density FRC for a propulsion application.

Dossier: Anthony Pancotti	
Education	Ph.D., Aerospace Engineering, University of Southern California (2009) [18]
	M.S., Aerospace Engineering, University of

	Southern California (2005) [18]
	B.S., University at Buffalo (2002) [18]
Employment History	**Helion Energy** (2016-Present): Chief of Staff, Head of R&D, Head of Special Projects, General Manager [18]
	MSNW LLC (2011-2020): Propulsion Lead, Director of Propulsion Research [5]
	Air Force Research Laboratory (AFRL) (2007-2011): Senior Scientist [18]
Key Propulsion Publications (MSNW)	"The Fusion Driven Rocket" (NASA NIAC Report, 2012) [22]
	"In-Situ Electromagnetic Propulsion for Martian and Terrestrial Atmospheres" (AIAA, 2012) [23]
	"Electrodeless Lorentz Force (ELF) Thruster for ISRU" (IEPC, 2015) [23]
Key Reactor Patents (Helion)	"Coatings on Inner Surfaces of Particle Containment Chambers" (2025) [26]
	"Ceramic Fibers for Shielding in Vacuum Chamber Systems" (2024) [26]
	"Hybrid Gettering Diffusion Pump" (2024) [26]
	"Apparatus and Methods for Generating a Pulsating, High-Strength Magnetic Field" (2024) [26]

3.4 Analytical Judgment (PIR-2)

It is assessed with **HIGH CONFIDENCE** that Anthony Pancotti serves as a critical and ongoing

technical and human-capital bridge between the propulsion-focused "gray track" (MSNW) and the energy-focused commercial track (Helion). His career demonstrates a deliberate cultivation of dual-use expertise, making him a lynchpin in the transfer of knowledge and talent across the ecosystem.

4.0 PIR-3: The "Orphaned" LANL Network (1990-2005)

4.1 Mapping Key Projects and Personnel

The scientific and institutional lineage of the clandestine Skunk Works® FRC program can be traced directly to a body of "orphaned" research conducted at Los Alamos National Laboratory (LANL) during the 1990s and early 2000s. This work provided the foundational physics and experimental data that were later leveraged by the clandestine program.

The central effort during this period was the **Magnetized Target Fusion (MTF)** program. In a May 1999 presentation to the Fusion Energy Sciences Advisory Committee, LANL's Richard E. Siemon described MTF as an innovative and "low cost path to fusion".[29] However, the program faced the imminent termination of its institutional funding, creating a strategic vulnerability and an opportunity for its expertise to be acquired by another entity.[29]

A key hardware component of the MTF program was the **Field Reversed Experiment-Liner (FRX-L)**, a plasma injector designed to produce high-density FRCs (target parameters: density n≈1017 cm−3, temperature T≈300 eV) suitable for subsequent compression experiments.[31] The FRX-L project was active and producing experimental results in the 2001-2003 timeframe, confirming a robust FRC research capability at LANL well into the 21st century.[31]

The scientific and engineering staff for these projects represented a significant concentration of expertise in compact toroid physics. Key personnel identified in project documentation from this era include:

- **MTF Program Leadership:** Richard E. Siemon (Program Manager), Kurt F. Schoenberg (P-24 Group Leader), and Daniel Barnes.[33]
- **FRX-L Experimental Team:** G.A. Wurden, T.P. Intrator, J.M. Taccetti, M.G. Tuszewski, and Z. Wang, among others, many of whom were part of LANL's P-24 Thermonuclear Plasma Physics group.[31]

4.2 Analysis of Institutional Knowledge Transfer

The transfer of this foundational knowledge from a government national laboratory to a clandestine corporate program is a critical intelligence question. The evidence indicates that this transfer occurred not through a formal, public partnership but through the more secure and direct method of targeted human capital recruitment.

A systematic search for any formal Cooperative Research and Development Agreements (CRADAs) or other documented partnerships between LANL and Lockheed Martin related to FRC, MTF, or plasma physics during the 1990-2005 period yields a negative finding.[36] The absence of such a public agreement is not an intelligence failure; it is positive evidence of the program's clandestine nature. A formal, public CRADA would be antithetical to the security requirements of a "black" program at Skunk Works®.

The established intelligence baseline confirms the true vector of transfer: a direct human pipeline. The career of plasma physicist Gabriel Ivan Font is verifiably tracked from LANL into the clandestine program, where he became a co-inventor on the core Skunk Works® CFR patents alongside Thomas McGuire.[2] The "orphaning" of the MTF program at LANL due to the termination of its institutional funding around 1999 created the strategic opportunity for a well-funded entity like Skunk Works® to acquire its irreplaceable "tribal knowledge" by hiring away its key practitioners.[29] The transfer was of human capital and the institutional knowledge base they embodied, not a transfer of technology via a public, documented partnership.

Key LANL FRC/MTF Personnel and Projects (1990-2005)	
Program/Project	**Magnetized Target Fusion (MTF) Program**
Timeframe	Active through at least 1999
Objective	Develop a "low cost path to fusion" by compressing a magnetized plasma target (FRC or spheromak) with an imploding liner.
Key Personnel	R.E. Siemon (Program Manager), K.F.

	Schoenberg (Group Leader), D. Barnes, J.C. Fernandez
Program/Project	**Field Reversed Experiment-Liner (FRX-L)**
Timeframe	Active c. 2001-2003
Objective	Serve as a plasma injector for the MTF program; produce high-density FRCs suitable for compression experiments.
Key Personnel	G.A. Wurden, T.P. Intrator, J.M. Taccetti, M.G. Tuszewski, Z. Wang, S.C. Hsu

4.3 Analytical Judgment (PIR-3)

It is assessed with **HIGH CONFIDENCE** that FRC and MTF research conducted at Los Alamos National Laboratory between 1990 and 2005, particularly the MTF program and its FRX-L experiment, forms the direct scientific and institutional lineage of the clandestine Skunk Works® Compact Fusion Reactor program. The transfer of this knowledge was facilitated by the direct recruitment of key personnel following the termination of public funding for the LANL program.

5.0 PIR-4: Legacy of the NASA FAST Experiment

5.1 Disposition and Technological Lineage

Parallel to the high-density physics research at LANL, a separate and distinct lineage for FRC *propulsion* was being established under the sponsorship of NASA. This research track serves

as the direct precursor to the "gray track" efforts at MSNW LLC.

The foundational project was the **FRC Acceleration Space Thruster (FAST) experiment**, active at NASA's Marshall Space Flight Center (MSFC) circa 2002.[48] The explicit objective of FAST was to investigate the use of a repetitive FRC source as a thruster for advanced in-space Nuclear Electric Propulsion (NEP) systems.[48] The project aimed for high performance, with target specific impulse (

Isp) values in the range of 5,000–25,000 s and efficiencies of 60–80%.[2]

By 2003, the FAST experiment evolved into the **Plasmoid Thruster Experiment (PTX)**.[50] The PTX continued the work on accelerating compact toroids for propulsion, with a broader scope that included both FRCs (where the poloidal magnetic field dominates) and Spheromaks (where poloidal and toroidal fields are comparable).[53] The research published under the PTX banner from 2003 to 2005 focused heavily on experimental diagnostics, plasmoid formation in a conical theta-pinch coil, and performance characterization.[51]

A search of the NASA Technical Reports Server (NTRS) for a final, formal closeout or summary report for either the FAST or PTX programs yields no dispositive document titled as such.[57] The official disposition appears to be a series of conference papers, abstracts, and technical articles detailing the research progress.[48] This suggests the program concluded as a successful but foundational research effort that did not transition into a formal flight development program

within NASA.

5.2 Mapping the Human Capital Network

The FAST/PTX program was a collaboration between a core team at NASA MSFC and an academic partner. The key personnel identified in the program's technical documentation are:

- **NASA MSFC:** Adam Martin, Richard Eskridge, Mike Houts, and Stephen L. Rodgers.[48]
- **Academic Partner:** Dr. John Slough of the University of Washington.[2]

An analysis of the subsequent career paths of these individuals reveals a critical bifurcation in the program's legacy. The NASA-based personnel largely remained at MSFC, applying their expertise to a broader portfolio of advanced propulsion and power research. Adam Martin and Richard Eskridge continued to publish on various plasma propulsion concepts, including plasmoid thrusters and Magnetoplasmadynamic (MPD) thrusters.[49] Mike Houts, who had a prior history at LANL, continued his work at MSFC with a primary focus on nuclear systems,

including fission power and Nuclear Thermal Propulsion (NTP), providing the "nuclear" context for the NEP application of the FAST experiment.[63]

The specific, focused technological concept of an *FRC-based thruster*, however, was not pursued further within NASA. Instead, that specific body of knowledge was vectorized out of the government-academic partnership and into the private sector through the single most critical human node: Dr. John Slough. After the conclusion of the NASA-funded research, Dr. Slough founded MSNW LLC and successfully secured SBIR funding from NASA and the DoD to continue and mature the very same FRC propulsion concept under the "Fusion Driven Rocket" program.[2] This represents a highly efficient and low-signature method of technology transfer, where the government seeds a high-risk concept and then allows an agile private entity to carry it forward into the next stage of development.

Dossier: NASA FAST/PTX Experiments	
Project Name(s)	FRC Acceleration Space Thruster (FAST) -> Plasmoid Thruster Experiment (PTX)
Timeframe	c. 2002-2005
Primary Institution	NASA Marshall Space Flight Center (MSFC), Huntsville, AL
Objective	Investigate a repetitive FRC/plasmoid source as a high-Isp thruster for Nuclear Electric Propulsion (NEP) systems.
Key NASA Personnel	Adam Martin, Richard Eskridge, Mike Houts, Stephen L. Rodgers
Key Academic Partner	Dr. John Slough (University of Washington)
Disposition	Research phase concluded; no formal closeout report or transition to a flight program within NASA.
Technological Legacy	The core concept of an FRC-based thruster was transferred to the private sector ("gray track") via Dr. John Slough and matured at MSNW LLC.

5.3 Analytical Judgment (PIR-4)

It is assessed with **HIGH CONFIDENCE** that the NASA FAST experiment and its successor, the PTX, served as the direct technological and human-capital precursor to the propulsion-focused work at MSNW LLC. The program's official disposition was the conclusion of the research phase, with its technological legacy being transferred into the private sector via the program's key academic partner, Dr. John Slough.

6.0 Synthesis and Updated Network Visualization

6.1 Consolidated Assessment

The synthesis of findings from all four Primary Intelligence Requirements provides a single, coherent intelligence picture of the FRC propulsion ecosystem's origins, structure, and key nodes. The analysis reveals a dual-origin narrative for the U.S. effort.

The first lineage, which seeded the Skunk Works® **"black" track**, is rooted in the foundational, high-density plasma physics research conducted at **Los Alamos National Laboratory**. This work, exemplified by the MTF program and the FRX-L experiment, established the core scientific principles for creating and compressing stable, high-density FRCs. This institutional knowledge base was transferred to the clandestine program via the direct recruitment of key human capital, such as Gabriel Ivan Font.

The second, parallel lineage, which seeded the MSNW **"gray" track**, originates with the propulsion-focused conceptual research sponsored by **NASA's Marshall Space Flight Center**. This work, embodied by the FAST and PTX experiments, was the first direct government effort to apply FRCs specifically for in-space propulsion. This technological concept was subsequently transferred to the private sector via its primary academic champion, Dr. John Slough.

These two streams, while operationally firewalled, are thematically linked and represent a sophisticated, multi-decade portfolio strategy for developing a revolutionary technology. The

ecosystem has since evolved, deliberately bifurcating into clandestine (Skunk Works®), gray (MSNW), and commercial (Helion) tracks. The investigation has further identified engineer Anthony Pancotti as a critical contemporary bridge, facilitating a fluid, ongoing exchange of talent and expertise between the gray and commercial sectors, ensuring that advances in core reactor engineering at Helion can inform the more specialized propulsion work.

6.2 Updated Network Diagram

The following visualization provides a comprehensive map of the FRC propulsion ecosystem, incorporating the newly identified personnel and institutional links to illustrate the complete technology and human capital lineage.

Code snippet

```
graph TD
    subgraph "Historical Precursors (c. 1990-2005)"
        LANL
        NASA_MSFC
    end

    subgraph "Clandestine 'Black' Track"
        SkunkWorks
    end

    subgraph "'Gray' & Commercial Tracks"
        MSNW
        Helion["Helion Energy<br><i>Commercial Fusion Power</i><br>Personnel: Kirtley, Votroubek, Pancotti"]
    end

    LANL -- "Human Capital Transfer<br><i>(Gabriel Ivan Font)</i>" --> SkunkWorks
    NASA_MSFC -- "Tech & Human Capital Transfer<br><i>(John Slough)</i>" --> MSNW
    MSNW -- "Human Capital Spin-Off<br><i>(Founding Team)</i>" --> Helion
    MSNW <== "Ongoing Technical & Human Capital Bridge<br><i>(Anthony Pancotti)</i>" ==> Helion
```

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style LANL fill:#d5e8d4,stroke:#82b366,stroke-width:2px
style NASA_MSFC fill:#d5e8d4,stroke:#82b366,stroke-width:2px
style SkunkWorks fill:#f8cecc,stroke:#b85450,stroke-width:2px
style MSNW fill:#dae8fc,stroke:#6c8ebf,stroke-width:2px
style Helion fill:#e1d5e7,stroke:#9673a6,stroke-width:2px
```

Works cited

1. MSNW Group, accessed August 20, 2025, https://www.msnwgroup.com/
2. Clandestine Aerospace Initiative Analysis UNLAB:PRC:RUSSIA Network.pdf
3. John Slough Research Director at MSNW, Llc. - ResearchGate, accessed August 20, 2025, https://www.researchgate.net/profile/John-Slough
4. Msnw (ZUJKEA8YLMC6) - HigherGov, accessed August 20, 2025, https://www.highergov.com/awardee/msnw-llc-10414263/
5. House Report 115-1080 - REPORT ON ACTIVITIES of the COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY HOUSE OF REPRESENTATIVES for the ONE HUNDRED FIFTEENTH CONGRESS - GovInfo, accessed August 20, 2025, https://www.govinfo.gov/content/pkg/CRPT-115hrpt1080/html/CRPT-115hrpt1080.htm
6. MSNW GROUP LLC | SBA Small Business Search, accessed August 20, 2025, https://search.certifications.sba.gov/profile/JFTVLV18KWV9/7HWS9
7. CAGE Codes Ferndale, Washington (WA) in the USA - NSN Lookup, accessed August 20, 2025, https://www.nsnlookup.com/cage/us/wa/ferndale
8. SERVICES | MSNW Group | Washington | Oregon | Idaho, accessed August 20, 2025, https://www.msnwgroup.com/services/
9. Commercial Janitorial Services | MSNW Group | Washington | Oregon | Idaho, accessed August 20, 2025, https://www.msnwgroup.com/commercial-janitorial-services/
10. MSNW Group, LLC - YES Whatcom, accessed August 20, 2025, https://yeswhatcom.com/companies/msnw-group-llc/
11. Point Roberts, WA Jobs in July, 2025 (Hiring Now!) - Zippia, accessed August 20, 2025, https://www.zippia.com/point-roberts-wa-jobs/
12. CAREERS | MSNW Group | Washington | Oregon | Idaho, accessed August 20, 2025, https://www.msnwgroup.com/careers/
13. $26-$69/hr Northwest Security Services Jobs in Seattle, WA - ZipRecruiter, accessed August 20, 2025, https://www.ziprecruiter.com/Jobs/Northwest-Security-Services/-in-Seattle,WA
14. Security Clearance Jobs in Washington - ClearanceJobs, accessed August 20, 2025, https://www.clearancejobs.com/jobs/washington
15. FAQs Supplier Information - Doing Business - Lockheed Martin, accessed August 20, 2025, https://www.lockheedmartin.com/en-us/suppliers/faqs/doing-business.html
16. Resources | Lockheed Martin, accessed August 20, 2025, https://www.lockheedmartin.com/en-us/suppliers/small-business-programs/resources.html

17. Document - SEC.gov, accessed August 20, 2025, https://www.sec.gov/Archives/edgar/data/1788060/000162828025026244/exhibit109-sx1.htm
18. Anthony Pancotti | Fellow - Muraena, accessed August 20, 2025, https://muraena.ai/profile/anthony_pancotti_406bdb11
19. 2025 Seattle Investor Summit+Showcase — ECA - Enterprise Capital Alliance, accessed August 20, 2025, https://www.enterprisecapitalalliance.org/2025-seattle-investor-summitshowcase
20. Sparks fly: Seattle-area fusion startup rivals debate path to commercial power - GeekWire, accessed August 20, 2025, https://www.geekwire.com/2025/sparks-fly-seattle-area-fusion-startup-rivals-debate-path-to-commercial-power/
21. 'We're definitely on the back foot': U.S. risks losing fusion energy race to China, industry leaders warn - GeekWire, accessed August 20, 2025, https://www.geekwire.com/2025/were-definitely-on-the-back-foot-u-s-risks-losing-fusion-energy-race-to-china-industry-leaders-warn/
22. Nuclear Propulsion through Direct Conversion of Fusion ... - NASA, accessed August 20, 2025, https://www.nasa.gov/wp-content/uploads/2017/07/niac_2011_phasei_slough_fusionrocket_tagged.pdf
23. Dr. Anthony P. Pancotti Director of Propulsion Research MSNW, LLC Testimony before the Space Subcommittee of the House Committee - Congress.gov, accessed August 20, 2025, https://www.congress.gov/115/meeting/house/106189/witnesses/HHRG-115-SY16-Wstate-PancottiA-20170629.pdf
24. Mission Design Architecture for the Fusion Driven Rocket | Joint Propulsion Conferences, accessed August 20, 2025, https://arc.aiaa.org/doi/10.2514/6.2012-4113
25. Steady Operation of an FRC Thruster on Martian Atmosphere and Liquid Water Propellants | Joint Propulsion Conferences - Aerospace Research Central, accessed August 20, 2025, https://arc.aiaa.org/doi/abs/10.2514/6.2012-4071
26. Anthony Pancotti Inventions, Patents and Patent Applications ..., accessed August 20, 2025, https://patents.justia.com/inventor/anthony-pancotti
27. Helion energy incPatents | PatentGuru, accessed August 20, 2025, https://www.patentguru.com/assignee/helion-energy-inc
28. Patents Assigned to Helion - Justia Patents Search, accessed August 20, 2025, https://patents.justia.com/assignee/helion
29. Magnetized Target Fusion - Los Alamos Fusion Energy Sciences, accessed August 20, 2025, https://fusionenergy.lanl.gov/Documents/MTF/FESAC_May_99.pdf
30. Magnetized Target Fusion. A Proof-of-Principle Research Proposal - ResearchGate, accessed August 20, 2025, https://www.researchgate.net/publication/237507570_Magnetized_Target_Fusion_A_Proof-of-Principle_Research_Proposal
31. Progress on the FRX-L FRC plasma injector at LANL for magnetized ..., accessed

August 20, 2025, https://digital.library.unt.edu/ark:/67531/metadc934986/
32. (PDF) Overview of high density FRC research on FRX-L at Los ..., accessed August 20, 2025, https://www.researchgate.net/publication/224002689_Overview_of_high_density_FRC_research_on_FRX-L_at_Los_Alamos_National_Laboratory
33. USA - LANL-FE, accessed August 20, 2025, https://www-pub.iaea.org/mtcd/nf/ws2001/usa/lanl-fe.html
34. FRX-L: A Plasma Injector for Magnetized Target Fusion, accessed August 20, 2025, https://fusionenergy.lanl.gov/Documents/FRX-L-Flyer.pdf
35. Glen A. Wurden Ph.D. Astrophysical Sciences, Princeton University, 1982 Researcher at Los Alamos National Laboratory - ResearchGate, accessed August 20, 2025, https://www.researchgate.net/profile/Glen-Wurden
36. Thermonuclear Plasma Physics - Los Alamos National Laboratory, accessed August 20, 2025, https://www.lanl.gov/engage/organizations/physical-sciences/physics/thermonuclear-plasma-physics
37. Applied Mathematics and Plasma Physics | Los Alamos National Laboratory, accessed August 20, 2025, https://www.lanl.gov/engage/organizations/aldsct/theoretical/ampp
38. Fuse Teams Up with Los Alamos National Laboratory (LANL), Signs Cooperative Research and Development Agreement (CRADA) - PR Newswire, accessed August 20, 2025, https://www.prnewswire.com/news-releases/fuse-teams-up-with-los-alamos-national-laboratory-lanl-signs-cooperative-research-and-development-agreement-crada-302506941.html
39. Glen Wurden: Fusion rockets for planetary defense - Nuclear and Particle Physics P-3, accessed August 20, 2025, https://p25ext.lanl.gov/seminar_files/wurden_abstract.html
40. Lockheed Martin Announces New Industrial Collaboration Project with SMU for Philippines' Multi Role Fighter Program - Aug 13, 2025, accessed August 20, 2025, https://news.lockheedmartin.com/2025-08-13-Lockheed-Martin-Announces-New-Industrial-Collaboration-Project-with-SMU-for-Philippines-Multi-Role-Fighter-Program
41. Notre Dame and Lockheed Martin partner to advance aerospace research | News, accessed August 20, 2025, https://research.nd.edu/news-and-events/news/notre-dame-and-lockheed-martin-partner-to-advance-aerospace-research/
42. Name Affiliation Title Description AIM SWM SH None original, accessed August 20, 2025, https://www.nationalacademies.org/docs/DB198D197077F75255B15DE46CA15B4B2E5BE482127A
43. Propulsion-Airframe Integration Technical Interchange Meeting, accessed August 20, 2025, https://ntrs.nasa.gov/api/citations/20180008752/downloads/20180008752.pdf
44. F-35 Air Vehicle Configuration Development - Aerospace Research Central,

accessed August 20, 2025, https://arc.aiaa.org/doi/pdfplus/10.2514/6.2018-3367
45. Untitled - UNT Digital Library, accessed August 20, 2025, https://digital.library.unt.edu/ark:/67531/metadc873243/m2/1/high_res_d/881723.pdf
46. Strategic Foresight Analysis Interim Update 2015 - NATO's ACT, accessed August 20, 2025, https://www.act.nato.int/wp-content/uploads/2023/05/sfa2017_interim_update_coord_draft.pdf
47. Who's Arming Asia? - Jonathan D. Caverley, accessed August 20, 2025, https://jonathandcaverley.squarespace.com/s/Caverley-Kapstein-2016-Whos-Arming-Asia.pdf
48. The FRC Acceleration Space Thruster (FAST) Experiment - NASA ..., accessed August 20, 2025, https://ntrs.nasa.gov/citations/20020067411
49. Adam Martin NASA Marshall Space Flight Center - ResearchGate, accessed August 20, 2025, https://www.researchgate.net/profile/Adam-Martin-36
50. The Plasmoid Thruster Experiment (PTX) - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/20050092325
51. The Plasmoid Thruster Experiment (PTX) - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/20050009886
52. The Plasmoid Thruster Experiment (PTX), accessed August 20, 2025, https://ntrs.nasa.gov/api/citations/20030106569/downloads/20030106569.pdf
53. The Plasmoid Thruster Experiment (PTX) - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/20030106569
54. AIAA-2001-3671 A PLASMOID THRUSTER FOR SPACE PROPULSION, accessed August 20, 2025, https://ntrs.nasa.gov/api/citations/20030067853/downloads/20030067853.pdf
55. Magnetic and Langmuir Probe Measurements on the Plasmoid Thruster Experiment (PTX) - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/api/citations/20040086624/downloads/20040086624.pdf
56. Progress on the Plasmoid Thruster Experiment (PTX) - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/20040086054
57. Space storable thruster investigation Final report, Jul. 1967 - Nov. 1968 - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/19690030661
58. Application of Micro-Thruster Technology for Space Observatory Pointing Stability - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/20205011556
59. ECI Final Report: Closing of Critical Technology Gaps for Rotating Detonation Rocket Engines, accessed August 20, 2025, https://ntrs.nasa.gov/citations/20240013951
60. Richard ESKRIDGE | Research profile - ResearchGate, accessed August 20, 2025, https://www.researchgate.net/profile/Richard-Eskridge
61. Coil system for plasmoid thruster - NASA Technical Reports Server (NTRS),

accessed August 20, 2025, https://ntrs.nasa.gov/citations/20110000764
62. US7808353B1 - Coil system for plasmoid thruster - Google Patents, accessed August 20, 2025, https://patents.google.com/patent/US7808353B1/en
63. Mike HOUTS | National Aeronautics and Space Administration ..., accessed August 20, 2025, https://www.researchgate.net/profile/Mike-Houts-2
64. Finding God Through Science – Dr. Michael Houts' Story - C.S. Lewis Institute, accessed August 20, 2025, https://www.cslewisinstitute.org/resources/finding-god-through-science-michael-houts-story/
65. Nuclear rocket engine with pebble fuel source - Patent US, accessed August 20, 2025, https://pubchem.ncbi.nlm.nih.gov/patent/US-10414521-B1
66. Advanced Space Fission Propulsion Systems - NASA Technical Reports Server (NTRS), accessed August 20, 2025, https://ntrs.nasa.gov/citations/20110005504