Kesslr Labs – Arcturus One Pager

Problem

- Qualifying, developing, and testing avionics takes years of duplicated effort, every program rebuilds and re-certifies from scratch.
- Legacy flight computers are certifiable but too slow for autonomy.
- AI accelerators are powerful but non-deterministic, uncertifiable, and not radiation tolerant.
- Result: fragmented systems, endless test campaigns, and billions in overruns.

Solution – Arcturus

Arcturus is a certifiable autonomy platform: radiation-tolerant, deterministic, AI-class compute paired with a unified software development kit (SDK) and pre-certified test suite.

- Skip years of qualification → pre-certified avionics modules with reusable compliance evidence.
- Safe autonomy out of the box → deterministic SDK with bounded-time, safety-ready libraries for control, autonomy, and inference.
- Faster testing, faster flying → validation harness integrated into hardware-in-the-loop / software-in-the-loop testing environments.

The same SDK and libraries extend to telemetry, communications, and payload processing, leading to a single ecosystem for spacecraft systems.

Beyond space: the same certification headaches exist in automotive (ISO 26262), medical devices (IEC 62304), industrial robotics (IEC 61508), mining (ISO 17757). Arcturus is positioned to become *the* cross-industry certifiable compute platform.

Why Now?

A convergence of technology, cost, and demand makes Arcturus inevitable today:

- Prototyping revolution: AI tooling, FPGAs, chiplets, and open-source electronic design automation allow small teams to build products for cheaper and at much faster speeds.
- Accessible fabrication: MPW reduce first silicon costs dramatically, enabling startup entry.
- Demand inflection: Space, defense, and climate systems require autonomy at the edge today, with delays more costly than ever.
- Certification pressure: Regulators are tightening standards (DO-178C, ISO 26262, IEC 62304), driving industries to adopt certifiable autonomy platforms instead of bespoke one-offs.

Team

Patrick Bellamy – Ex-Flight Software @ Rocket Lab; led University of Melbourne Rocketry to international success; IAC-published. Expertise in flight-critical software + leadership of teams of 100+ engineers.

Jack Ulbrich-Baker – Ex-GNC @ Rocket Lab; led Monash Rover Team; IEEE-recognized publications. Deep control systems expertise and hardware execution + leadership of teams of 100+ engineers.

Together: proven leaders in mission-critical avionics, leveraging a university ecosystem for rapid prototyping, talent, and extensive testing. Through partnerships with student teams, Arcturus will build a community of hundreds of beta developers, providing validation and driving early adoption at scale.

Market Opportunity

- The global space economy is projected to grow to $1.8T by 2035 (McKinsey, 2023).
- Over 70,000 satellites are expected to launch this decade (Goldman Sachs, 2024).
- Automotive electronics will surpass $600B by 2030 (McKinsey, 2023).

Arcturus directly addresses the compute gap in these markets:

Sector	TAM Contribution	Avionics/Compute Opportunity
Satellites & Launch	$200B+	$7-10B+ (Satellite + Launch Avionics)
Defense Autonomy	$120-180B	$10-20B+ (C2, ISR, UAV swarms)
Automotive Safety	$600B+	$90–160B+ (ISO 26262 systems, ADAS/robotaxi)
Medical Devices	$1.3T	$90–160B+ (surgical robotics, imaging, infusion)
Industrial, Energy, Adjacent Infra*	$800B+	$55–150B+ (industrial automation, power grids, rail, maritime, mining)

*Adjacencies include power & rail signaling, maritime robotics, and autonomous mining systems.

TAM: **$250–500B+** by 2035

Arcturus begins with aerospace and defense, a >$10B beachhead market today, but the same certification and autonomy challenges exist across automotive, medical, and industrial systems. This positions Arcturus not just as a space technology, but as a cross-industry certifiable autonomy platform.

Roadmap

- Q4 ’25 → FPGA prototypes + SDK devkits.
- H1 ’26 → Supersonic & radiation test campaigns; launch certification toolchains.
- H2 ’26 → Multi-project wafer (first silicon run); early aerospace pilots.
- H1 ’27 → First silicon bring-up + SDK ecosystem release.
- H2 ’27 → Validation (radiation & supersonic); pilot aerospace & defense contracts.
- H1 ’28+ → Platform expansion: telemetry, comms, payload processing → extend beyond aerospace into automotive, medical, industrial.

The Ask

Stage	Amount	Duration	Outcomes
Pre-Seed	$500k – 1.0M	8 mo	FPGA prototypes flying, SDK initial release, initial radiation + supersonic validation, begin obtaining flight heritage.
Seed	3.0M – 5.0M	18-24 mo	First silicon fabricated & validated, chips + SDK deployed to pilot aerospace customers, initial contracts secured.

Kesslr Labs – Making space easy.
info@kesslr.com | kesslr.com