

# Zero-Egress Academic Research Data Management (RDM): Cryptographic Integrity & Multi-Gigabyte Scientific Dataset Distribution (Vol. 2)

Cross-Institutional Distribution of Genomic FASTQ, Astronomical FITS, Geospatial  
GeoTIFF & Clinical DICOM Datasets

**Official Harvard University Dataverse DOI (10.7910/DVN/M6TLOS):** <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/M6TLOS>

**Harvard Dataverse Research Collection (limeshare):** <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/M6TLOS>

**LimeShare Main Zero-Knowledge Transfer Portal:** <https://limeshare.org>

**Academic Research & Cryptography Hub:** <https://limeshare.org/research>

**All Working Papers, PDFs & CERN Zenodo DOIs:** <https://limeshare.org/papers>

**Open Benchmark Dataset (CSV, JSONL, BibTeX):** <https://limeshare.org/data>

**LimeDrop Direct Browser-to-Browser WebRTC P2P:** <https://limeshare.org/drop>

**Offline In-Browser AES-256-GCM + Argon2id File Encryptor:** <https://limeshare.org/tools/encrypt-fi>

**Client-Side SHA-256 Checksum Verifier:** <https://limeshare.org/tools/file-checksum>

**Certified Cryptographic Destruction Verifier:** <https://limeshare.org/verify-receipt>

**Developers, Terminal CLI & CI/CD Streaming:** <https://limeshare.org/developers>

**2026 Master Guide to Large File Transfer & Zero-Egress:** <https://limeshare.org/ultimate-file-tran>

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## 1. The Egress Bottleneck in University Collaborations

Hyperscale cloud storage providers charge \$0.08-\$0.12 per GiB of outbound egress traffic, making ad-hoc cross-institutional sharing of 50-500 GiB research datasets prohibitively expensive for university laboratories. Furthermore, standard consumer file-sharing services strip checksums, inspect unencrypted filenames, and throttle high-bandwidth NREN links (Internet2, GEANT, JANET, DFN).

LimeShare combines zero-egress Cloudflare R2 edge storage with client-side LSC1 AES-256-GCM streaming and in-browser SHA-256 integrity verification (<https://limeshare.org/tools/file-checksum>), reducing the marginal egress cost of multi-gigabyte dataset distribution to \$0.00.

## 2. Scientific Format Profiles & Reverse-Drop Portals

Using LimeShare Receive-Files Portals (<https://limeshare.org/request-files>), principal investigators can publish a zero-knowledge intake link for external sequencing centers, field stations, or partner universities to deposit up to 1 TB of encrypted raw data directly from a browser or terminal CLI (`npx @limeshare/cli`).

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## How to Cite This Working Paper (BibTeX & APA)

APA: LimeShare Cryptography & Distributed Systems Lab. (2026). Zero-Egress Academic Research Data Management (RDM): Cryptographic Integrity & Multi-Gigabyte Scientific Dataset Distribution (Vol. 2). Harvard Dataverse (10.7910/DVN/M6TLOS) & CERN Zenodo (10.5281/zenodo.23671754). <https://doi.org/10.5281/zenodo.23671754>

**Permanent CERN Zenodo DOI (10.5281/zenodo.23671754):** <https://doi.org/10.5281/zenodo.23671754>

Permanent Harvard Dataverse DOI (10.7910/DVN/M6TLOS): <https://doi.org/10.7910/DVN/M6TLOS>