## About K-Sense

**K-Sense** enables remote and in-situ sensing of material degradation by analyzing spectral and imaging data. Unlike conventional photon-counting approaches, K-Sense extracts hidden spectral signatures and translates them into actionable insights on aging, composition, and survivability. It bridges the gap between observation and prediction—turning optical data into reliability metrics for space, defense, and energy systems.

**Explore more at**
**https://www.karax.us/k-sense**

## K-Sense Modules

- **Spectral Decomposition:** Visible, IR, and near-IR data cleaning and noise removal.
- **Signature Extraction:** Machine-learned models trained on space-aged polymers (MISSE data).
- **Material Identification:** Distinguish coatings, composites, and encapsulants remotely.
- **Degradation Mapping:** Predict optical, thermal, and mechanical changes.
- **Image:** Spectral curve with highlighted absorption bands.

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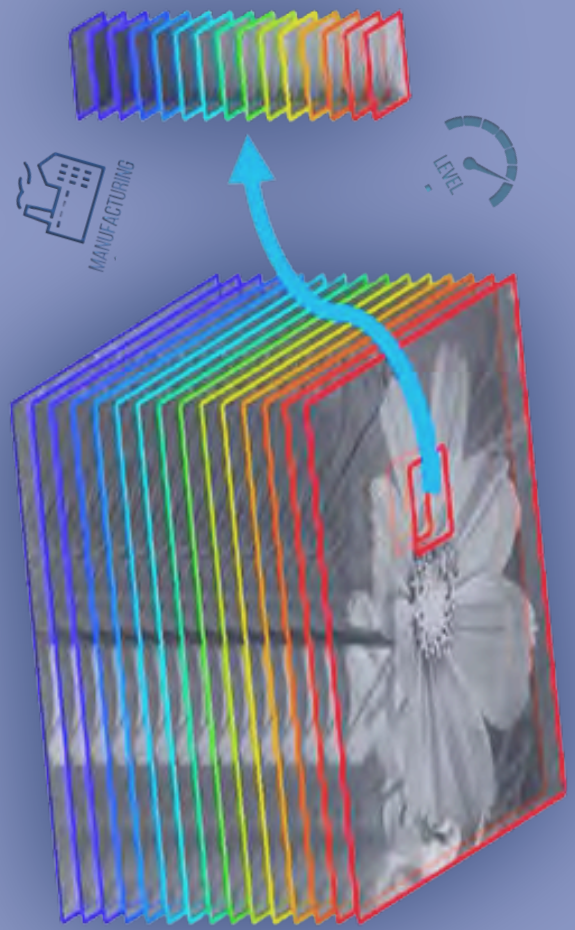
**K-Sense**
See Beyond the Visible

# Observe Analyze & Monitor

From RGB/IR spectral images to actionable predictions of Material performance

## Applications

- Space Domain Awareness: Identify, classify, and age spacecraft materials in orbit.
- Defense: Distinguish friendly vs. adversary assets by surface degradation patterns.
- Energy: Remote monitoring of coatings, composites in solar farms.
- Nuclear: Track radiation-induced material changes via spectral signatures



## Workflow

1. Data Collection: RGB/IR images, telescopes, inspector satellites.
2. Noise Filtering: Correct for angle, phase, atmosphere.
3. Signature Analysis: Hybrid ML + physics library of degraded materials.
4. Prediction: Material condition, degradation state, survivability index.
5. Output: Reports, API feeds, link to

## Benefits

- Transforms RGB/IR imagery into actionable material intelligence
- Provides non-contact, non-destructive condition monitoring
- Leverages real space-aged datasets for higher predictive confidence
- Enables early detection of surface degradation in orbit
- Supports defense, aerospace, energy, and nuclear applications
- Reduces operational risk by anticipating material survivability limits
- Integrates seamlessly with K-Extreme and K-Load for multi-stressor analysis
- API-ready outputs streamline integration into ground-based monitoring systems