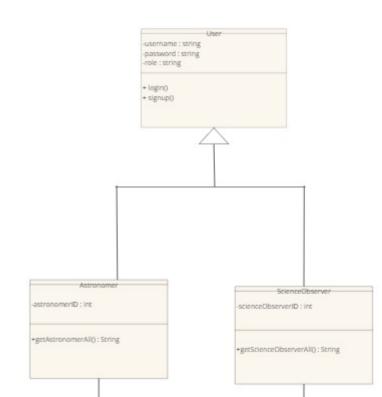
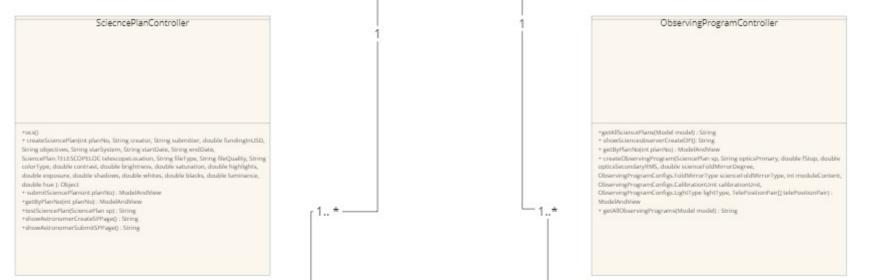


LoginController @Autowired - private UserRepository userRepository; @Autowired - private AstronomerRepository astronomerRepository; @Autowired - private ScienceObserverRepository scienceObserverRepository; +showLoginPage(): String + login(String username, String password, String role)): Object + showsignupPage(): String + addNewUser(String username, String password, String role)): Object + getAllUsers(): Iterable<User> +getAllSciencObserver(): Iterable<ScienceObserver> +getAllAstronomer(): Iterable<Astronomer>









```
SciencePlanModelGDDG
+ sciencePlan(String creator, String submitter, double funding in USD, String objectives, StarSystem, CONSTELLATIONS starSystem, Date starsDate, Date
andDate, SciencePlan TELESCOPELOC telescopeLocation, String EleType, String fileQuality, String colorType, double contrast, double brightness, double
saturation, double highlights, double exposure, double shadows, double whites, double blacks, double luminance, double hue )
+ getStarSystem(): StarSystem.CONSTGLLATIONS
+ setStarSystem(StarSystem.CDNSTELLATIONS) : void
* getTelescopeLocation() : SciencePlan TELESCOPELOC
+ setTelescopeLocation(SciencePlan,TELESCOPELOC) : void
+ getDataProcRequirements(): AntayLito+DataProcRequirement>
+ serDataProcRequirements(String fileType, String fileQuality, String colorType, double contrast, double brightness, double saturation, double
highlights, double exposure, double shadows, double whites, double blacks, double luminance, double huel : void
```

-creator: String

-cubmitter: String -fundinginLISD: double

-objectives : String

-startDate : Date

-endDate: Date

-fileType: Spring

-colorType: String

-contrast: double -brightness: double

-caturation: double

-highlighos: double -exposure: double -shadows: double -whiter: double -blacks: double -luminance: double - hus: double + sciencePlan()

+ getter and setter for all method

* getCreator() : String

+ sastineaton(String) : void

+ setSubmitten(String) : void

+ getFundinginUSD() : double

+ setObjectives(String) : void

+ setFundinginUSD(double) : void

+ getSubmitter(): String

+ getObjectives(): String

+ getStamDate() : String

+ getEndDate() : String

+ getPlanNo(): int

woo(colong) : String

+ setPlanNolint) : void

+ getStatus() : SciencePlan.STATUS + tetStatus/SciencePlan.STATUS) : vold

+ setStartDate(String) : void

+ sarStartDate(Date) - void

+ setEndDate(String) : void

+ satEndDate(Date): void

-SciencePlan STATUS : Enum -SciencePlan TELESCOPELOC : Enum

```
ObservingProgramModelGDDG
```

```
- planNo : int.
-optics Primary: String
-fStop: double
-opticsSecondaryRtMS : double
-scienceFoldMirrorDegree : double
- scienceFoldMirrorType : ObservingProgramConfigs.FoldMirrorType
-moduleContent : int
- calibrationUnit : ObservingProgramConfigs.CalibrationUnit
-lightType : ObservingProgramConfigs.LightType I
- telePositionPair : TelePositionPair[]
```

+observing/hogram()

telePositionPair)

- +observing(*rogram(int planNo, String optics/*rimary, double (Stop, double optics/secondary(NMS, double
- sciencefoldMirrorDegree, ObservingProgramConfigs.FoldMirrorType sciencefoldWirrorType, int moduleContent, ObservingProgramConfigs.CalibrationUnit calibrationUnit, ObservingProgramConfigs.LightType [ightType, TelePositionPair]
- + gotPlanNo(): int.
- + setPlanNo(nt) : void
- + getCerniniLocation(): String
- + setCerniniLocation(String): void +getOpticsPrimary(): String
- + setOptics/rimary(String) : void + setfStop(double) : void
- + get/Stop() : double + getOpticsSecondary(IMS() : double
- + setOpticsSecondaryRMS(double) : void
- + getScienceFoldMirrorDegree(): double
- + setSciencel oldMmorDegrex(double) : vaid
- + gatScienceFoldMirrorType(): ObservingProgramConfigs.FoldMirrorType
- + setSciencel oldMmorType(ObservingProgramConfigs.FoldMmorType): void
- + getModuleContent() : int + setModuleContent(int) : void
- +getCalibrationLinit(): Observing/rogramConfigs.CalibrationLinit
- + setCalibrationUnit(ObservingProgramConfigs.CalibrationUnit): void + getLightType(): ObservingProgramConfigs.LightType
- + setLightType(ObservingProgramConfigs.LightType) : void
- + getTelePositionPart(): TelePositionPart()
- + setTelePositionPair(TelePositionPair(]): void
- + getValidationStatus() : boolean + setValidationStatus(boolean): void
- + validateObservingCondition(ObservingProgram) : ObservingProgram
- +toString): String

SciencePlanModelGDDG

-creator: String -submitter: String -fundingInUSD: double -objectives: String -startDate: Date -endDate: Date

-SciencePlan.STATUS: Enum -SciencePlan.TELESCOPELOC: Enum

-fileType: String
-fileQuality: String
-colorType: String
-contrast: double
-brightness: double
-saturation: double
-highlights: double
-exposure: double
-shadows: double
-whites: double
-blacks: double
-luminance: double

+ sciencePlan()

- hue: double

- + sciencePlan(String creator, String submitter, double fundingInUSD, String objectives, StarSystem.CONSTELLATIONS starSystem, Date startDate, Date endDate, SciencePlan.TELESCOPELOC telescopeLocation, String fileType, String fileQuality, String colorType, double contrast, double brightness, double saturation, double highlights, double exposure, double shadows, double whites, double blacks, double luminance, double hue)
- + getter and setter for all method
- + getCreator(): String
- + setCreator(String) : void
- + getSubmitter(): String
- + setSubmitter(String): void
- + getFundingInUSD(): double
- + setFundingInUSD(double): void
- + getObjectives(): String
- + setObjectives(String): void
- + getStarSystem(): StarSystem.CONSTELLATIONS
- + setStarSystem(StarSystem.CONSTELLATIONS) : void
- + getStartDate() : String
- + setStartDate(String) : void
- + setStartDate(Date) : void
- + getEndDate() : String
- + setEndDate(String): void
- + setEndDate(Date) : void
- + getTelescopeLocation(): SciencePlan.TELESCOPELOC
- + setTelescopeLocation(SciencePlan.TELESCOPELOC): void
- + getDataProcRequirements(): ArrayList<DataProcRequirement>
- + setDataProcRequirements(String fileType, String fileQuality, String colorType, double contrast, double brightness, double saturation, double highlights, double exposure, double shadows, double whites, double blacks, double luminance, double hue): void
- + getPlanNo() : int
- + setPlanNo(int) : void
- + getStatus(): SciencePlan.STATUS
- + setStatus(SciencePlan.STATUS): void
- +toString(): String

ObservingProgramModelGDDG

- planNo : int
- -opticsPrimary: String
- -fStop: double
- -opticsSecondaryRMS : double-scienceFoldMirrorDegree : double
- scienceFoldMirrorType : ObservingProgramConfigs.FoldMirrorType
- -moduleContent : int
- calibrationUnit : ObservingProgramConfigs.CalibrationUnit
- -lightType : ObservingProgramConfigs.LightType I
- telePositionPair: TelePositionPair[]

- +observingProgram()
- +observingProgram(int planNo, String opticsPrimary, double fStop, double opticsSecondaryRMS, double scienceFoldMirrorDegree, ObservingProgramConfigs.FoldMirrorType scienceFoldMirrorType, int moduleContent, ObservingProgramConfigs.CalibrationUnit calibrationUnit, ObservingProgramConfigs.LightType lightType, TelePositionPair[] telePositionPair)
- + getPlanNo(): int
- + setPlanNo(int) : void
- + getGeminiLocation(): String
- + setGeminiLocation(String): void
- + getOpticsPrimary(): String
- + setOpticsPrimary(String): void
- + setfStop(double) : void
- + getfStop(): double
- + getOpticsSecondaryRMS(): double
- + setOpticsSecondaryRMS(double) : void
- + getScienceFoldMirrorDegree(): double
- + setScienceFoldMirrorDegree(double): void
- + getScienceFoldMirrorType(): ObservingProgramConfigs.FoldMirrorType
- + setScienceFoldMirrorType(ObservingProgramConfigs.FoldMirrorType): void
- + getModuleContent(): int
- + setModuleContent(int): void
- + getCalibrationUnit(): ObservingProgramConfigs.CalibrationUnit
- + setCalibrationUnit(ObservingProgramConfigs.CalibrationUnit): void
- + getLightType(): ObservingProgramConfigs.LightType
- + setLightType(ObservingProgramConfigs.LightType): void
- + getTelePositionPair(): TelePositionPair[]
- + setTelePositionPair(TelePositionPair[]): void
- + getValidationStatus(): boolean
- + setValidationStatus(boolean) : void
- + validateObservingCondition(ObservingProgram): ObservingProgram
- + toString(): String

SciencePlan

-creepor: String -submitter: String AundinginUSD: double -objectives: String -custOsse : Date -endDate: Date nuch: 2,7472 roll-envirol--ScienceRion, TSLESCOPELOC : Brium -fileType: Spring -fieQualty String -colorType: String -contrast: double -brightness double -saturation: double -highlights: double -exposure: double -shadows: double -whiter: double

endCate, SciencePlan TSESCIPTUSC seleculars to union, String SteType, String SteTypaday, String colorType, double-contact disable to giveney, double Consistent about the highlights, double reporters about the shadows, double white, double blocks, double becomes about the li-

* getter and uniter for all revitoral

- + gettraster) foreg · ortEnutration(firing) with
- * gettalentter)-fireg

-blacks double -luminance double - hust double

- + setubentive(tiring) wait
- + or Pursing in DRD strukter yord
- · gettigeneet)-time + settligeslave(String) word.
- · gettiartysiem) Nartysiem-CONSTRUKTIONS
- + gettletheep tree
- + unbiasticity (tring) mid
- · gestealfield) tiving
- + unfredberglings well
- + selfodDateDateLysts * gethinsopel scaling - forecoffee ffor FEDFILDE
- + self-ries upot as allow/fices office TRUPECOFFLOCS and
- * setDataPrist Requirements/String StrType, String McQuality, Mring colorType, disable instruct, deader legisteres, deader scharation, deader

highlights, doubte exposure, studite studium, studite whites, double blacks, studite barriance, studite hare) - exist.

- + setficeNotes1 vest
- · settioned recording ATRIAN year
- wastings, tring



ObservingProgramModelGDDG

```
- planNo : int
-opticsPrimary : String
```

-fStop : double

-pprictSecondaryRMS : double

-scienceFoldMirrorDegree : double

- scienceFoldMirrorType : ObservingProgramConfigs.FoldMirrorType

-moduleContent : int

- calibrationUnit : ObservingProgramConfigs.CalibrationUnit

-lightType : ObservingProgramConfigs.LightType |

- telePositionPair : TelePositionPairf1

+observingProgram@rc planNo, String opticsPrimary, double 1920, double opticsSecondaryRMS, double

scienceFoldMirrorDegree, ObservingFragramConfigs.FoldMirrorType scienceFoldMirrorType, int moduleContent,

ObservingProgramConfigs.CalibrationLinit calibrationLinit, ObservingProgramConfigsLightType lightType, TelePositionPair()

telePositionPairi

- + getPlanNo(): ins
- + setPlanNo(nt): void
- + getGeminLocation(): String
- + setGeminiLocation(String) : void
- + getOpticsPrimary() : String
- + setOpticsPrimary(String): void
- + tertficos(double) : void + petficop() : double
- + getOptictSecondaryRMS(): double
- + setOptictSecondaryRMS(double) : void
- + getScienceFoldfidimorDegree() : double
- + setScienceFoldMirrorDegree(double) : sold
- + getScienceFoldMirrorType(): ObservingProgramConfigs.FoldMirrorType
- + tetScienceFoldMirrorType(ObservingFrogramConfigs.FoldMirrorType) : void
- + getNoduleConsens) : Inc.
- + tetVloduleContent(int) : void
- + getCalbrationUnit): ObservingProgramConfigs.CalibrationUnit
- + secCalibrationUnit(CibraryingProgramConfigs.CalibrationUnit) : sold
- + petLightType(): ObservingProgramConfigsLightType
- + setLightType(DisservingProgramConfigsLightType) : void
- + getTelePositionPairt] : TelePositionPairt[]
- + setTelePositionPain(TelePositionPain()) : void
- + getValidationStatus() : boolean + setilal distor@ssue/booleant : void
- + validateObservingCondition(ObservingProgram):: ObservingProgram
- + tolkring): String

SciencePlan

-creator : String -submitter: String -fundingInUSD: double -objectives : String -startDate : Date -endDate : Date

-SciencePlan.STATUS : Enum -SciencePlan.TELESCOPELOC : Enum

-fileType: String
- fileQuality: String
-colorType: String
-contrast: double
-brightness: double
-saturation: double
-highlights: double
-exposure: double
-shadows: double
-whites: double
-blacks: double
-luminance: double
- hue: double

+ sciencePlan()

- + sciencePlan(String creator, String submitter, double fundingInUSD, String objectives, StarSystem.CONSTELLATIONS starSystem, Date startDate, Date endDate, SciencePlan.TELESCOPELOC telescopeLocation, String fileType, String fileQuality, String colorType, double contrast, double brightness, double saturation, double highlights, double exposure, double shadows, double whites, double blacks, double luminance, double hue)
- + getter and setter for all method
- + getCreator(): String
- + setCreator(String): void
- + getSubmitter(): String
- + setSubmitter(String): void
- + getFundingInUSD(): double
- + setFundingInUSD(double) : void
- + getObjectives() : String
- + setObjectives(String): void
- + getStarSystem() : StarSystem.CONSTELLATIONS
- + setStarSystem(StarSystem.CONSTELLATIONS) : void
- + getStartDate(): String
- + setStartDate(String) : void
- + setStartDate(Date) : void
- + getEndDate(): String
- + setEndDate(String) : void
- + setEndDate(Date) : void
- + getTelescopeLocation() : SciencePlan.TELESCOPELOC
- + setTelescopeLocation(SciencePlan.TELESCOPELOC) : void
- + getDataProcRequirements(): ArrayList<DataProcRequirement>
- + setDataProcRequirements(String fileType, String fileQuality, String colorType, double contrast, double brightness, double saturation, double highlights, double exposure, double shadows, double whites, double blacks, double luminance, double hue): void
- + getPlanNo(): int
- + setPlanNo(int) : void
- + getStatus() : SciencePlan.STATUS
- + setStatus(SciencePlan.STATUS) : void
- +toString(): String



ObservingProgramModelGDDG

- planNo : int

-opticsPrimary: String

-fStop: double

-opticsSecondaryRMS : double
 -scienceFoldMirrorDegree : double

scienceFoldMirrorType: ObservingProgramConfigs.FoldMirrorType

-moduleContent:int

- calibrationUnit : ObservingProgramConfigs.CalibrationUnit

-lightType: ObservingProgramConfigs.LightType I

telePositionPair: TelePositionPair[]

+observingProgram()

+observingProgram(int planNo, String opticsPrimary, double fStop, double opticsSecondaryRMS, double scienceFoldMirrorDegree, ObservingProgramConfigs.FoldMirrorType scienceFoldMirrorType, int moduleContent, ObservingProgramConfigs.CalibrationUnit calibrationUnit, ObservingProgramConfigs.LightType lightType, TelePositionPair[] telePositionPair)

+ getPlanNo(): int

+ setPlanNo(int) : void

+ getGeminiLocation(): String

+ setGeminiLocation(String): void

+ getOpticsPrimary(): String

+ setOpticsPrimary(String): void

+ setfStop(double) : void

+ getfStop(): double

+ getOpticsSecondaryRMS(): double

+ setOpticsSecondaryRMS(double) : void

+ getScienceFoldMirrorDegree(): double

+ setScienceFoldMirrorDegree(double) : void

+ getScienceFoldMirrorType(): ObservingProgramConfigs.FoldMirrorType

+ setScienceFoldMirrorType(ObservingProgramConfigs.FoldMirrorType): void

+ getModuleContent(): int

+ setModuleContent(int): void

+ getCalibrationUnit(): ObservingProgramConfigs.CalibrationUnit

+ setCalibrationUnit(ObservingProgramConfigs.CalibrationUnit): void

+ getLightType(): ObservingProgramConfigs.LightType

+ setLightType(ObservingProgramConfigs.LightType): void

+ getTelePositionPair(): TelePositionPair[]

+ setTelePositionPair(TelePositionPair[]): void

+ getValidationStatus(): boolean

+ setValidationStatus(boolean): void

+ validateObservingCondition(ObservingProgram): ObservingProgram

+ toString(): String

Data Processing Request

-fileType: String
- fileQuality: String
-colorType: String
-contrast: double
-brightness: double
-saturation: double
-highlights: double
-exposure: double
-shadows: double
-whites: double
-blacks: double
-luminance: double
- hue: double

DataProcRequirements (String fileType, String fileQuality, String colorType, double contrast, double brightness, double saturation, double highlights, double exposure, double shadows, double whites, double blacks, double luminance, double hue)

- + getFileType(): String
- + setFileType(String): void
- + getFileQuality(): String
- + setFileQuality(String): void
- + getColorType(): String
- + setColorType(String): void
- + getContrast(): double
- + setContrast(double): void
- + getBrightness(): double
- + setBrightness(double): void
- + getSaturation(): double
- + setSaturation(double): void
- + getHighlights(): double
- + setHighlights(double): void
- + getExposure(): double
- + setExposure(double): void
- + getShadows(): double
- + setShadows(double): void
- + getWhites(): double
- + setWhites(double): void
- + getBlacks(): double
- + setBlacks(double): void
- + getLuminance(): double
- + setLuminance(double): void
- + getHue(): double
- + setHue(double): void